Radio Communication

May 1990

The first 35 years of GB2SM: Amateur Radio at the Science Museum

Construction project: G4WIM 50/70MHz ALL-MODE TRANSCEIVER

Also:
Young Amateur of the Year Application Form

G4WIM

G3DRN

RSGB QSL Managers
Ted and Aileen Allen retire

All QSL cards now go to
RSGB QSL BUREAU
P.O. BOX 1773
POTTERS BAR
HERTS EN6 3EP
ENGLAND

KENWOOD

More of everything - except cost

The new series of FM mobiles from Kenwood really do have more of everything; more power (50W on 2 metres), with three power levels (50W, 10W, 5W); more usable sensitivity (better than 0.16 microvolts for 12dB SINAD); more channel spacings (5, 10, 12.5, 15, 20, 25 kHz); more flexibility using the RC-20 controller and IF-20 interface (up to 4 transceivers from one controller); more memories (20 multi function); and even more bands, because the full range consists of the TM-231E for 2 metres, the TM-431E for 70 centimetres, the TM-531E for 23 centimetres, and finally the TM-701E for dual band 2/70 FM.

Every function that you could ever want is included in the specification - there is even an optional digital speech store which will store received or transmitted messages of up to 32 seconds, allowing the operator to quickly check or return any call. Even the microphone has been designed to give you full control of the transceiver from one hand, with tone burst, memory recall, VFO recall, and UP/DOWN functions provided; but the UP/DOWN is not just operating frequency but memory channel number and even the frequency of the built in sub-audible tone encoder.

There is even a fourth button on the microphone which can be user programmed to select MHz steps, or repeater shift, or reverse repeater, or digital record selection, or low power; all as you wish. Extremely comprehensive and easy to use in the Kenwood manner.

This exciting new range of FM mobiles from Kenwood is now available at your approved Kenwood dealer. Try them out; you will not be disappointed, particularly with the prices. As I said "More of everything, except cost".

TM-231E	(2m)	**£289**
TM-431E	(70cm)	**£318**
TM-531E	(23cm)	**£385**
TM-701E	(2/70)	**£469**

LOWE ELECTRONICS LTD.

Chesterfield Road, Matlock, Derbyshire DE4 5LE Telephone 0629 580800 (4 lines)

Sole Appointed UK Distributor for KENWOOD Amateur Radio

News and Editorial

Marcia Brimson
Peter Chadwick, G3RZP
Mike Dennison, G3XDV
David Evans, G3OUF
Dave Simmonds, G3JKB

Production

Derek Cole
Sid Clark

Radio Communication

VOLUME 66 No 5 **MAY 1990**

CONTENTS

Cover theme:
OSL Bureau Move — page 28

Youth and amateur radio Thinking Day On The Air and Jamboree On The Air — page 6

The ITU and amateur radio ITU Secretary General addresses the IARU Conference — page 5

All contributions and correspondence concerning the content of *Radio Communication* should be posted to:

The Editor
Radio Communication
Lambda House, Cranborne Road
Potters Bar, Herts EN6 3JE

Tel (Editorial): 0707 59015
Fax (Editorial): 0707 49503
Tel (GB2RS late changes): 0707 59260
E-mail (Telecom Gold): 76:MSX020
Prestel Page 8107

Reports for *Spectrum Analysis* should be sent to the Band Editors:
HF
John Allaway, G3FKM, 10 Knightlow Road, Birmingham B17 8QB
VHF/UHF
Norman Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey CR2 1EZ (Telecom Gold 76:MSX022)
Telex: 9312132256 (SAG)
SWL
Bob Treacher, 93 Elibank Road, Eltham, London SE9 1QJ
MICROWAVES
Mike Dixon, G3PFR, Woodstock, Gazebank, Norley, Warrington, Cheshire WA6 8LL

ADVERTISING
All display and classified advertising enquiries (excepting Members' Ads) should be directed to our advertisement agents:
Victor Brand Associates Ltd., 'Weat Barn', Low Common, Bunwall, Norwich, Norfolk NR16 1SY.
Tel: 095 389 8473
Fax: 095 389 8437

***Radio Communication* is published by the Radio Society of Great Britain as its official journal on the first day of the relevant month and is sent free and post paid to all members of the Society.**

Closing date for contributions, unless otherwise notified, is five weeks prior to publication date

Filmset by JJ Typographics Ltd, Unit 4, Baron Court, Chandlers Way, Temple Farm Industrial Estate, Southend-on-Sea, Essex SS2 5SE.

Printed by Mayhew McCrimmon Printers Ltd, Units 1-4 Star Lane Industrial Estate, Great Wakering, Essex. SS3 0PJ

ABC MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS **35,422 copies per issue average circulation in 1988**

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

Founded 1913 Incorporated 1926 Limited by guarantee
Member society of the International Amateur Radio Union

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

Membership is open to all those with an active interest in radio experimentation and communication as a hobby. Applications for membership should be made to the Membership Services Department from which full details of Society services may also be obtained

Headquarters and registered office:
Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE
Telex 9312 130923 (RSGB)
Electronic mail via Dialcom/Telecom Gold 87:CQO083
Telephone: 0707 59015. Fax: 0707 45105

Secretary and Chief Executive: David Evans, MSAE, CPL, G3OUF
General Manager: David Simmonds, G3JKB

COUNCIL OF THE SOCIETY

PRESIDENT: Frank Hall, GM8BZX
EXECUTIVE VICE PRESIDENT: John Case, GW4HWR
IMMEDIATE PAST-PRESIDENT:
Julian Gannaway, G3YGF
HONORARY TREASURER: W J McClintock, G3VPK

ORDINARY MEMBERS OF COUNCIL
E J Allaway, MB, ChB, MRCS, LRCP, G3FKM
J Bazley, G3HCT
G L Benbow, Msc, CEng, MIEE, G3HB
Mrs M H Claytonsmith, G4JKS
G R Jessop, CEng, MIEE, G6JP
T I Lundegard, G3GJW
A McKenzie, MBE, CEng, FIEE, FAES, G3OSS
F S G Rose, G2DRT

ZONAL MEMBERS OF COUNCIL
Zone A G R Smith, BSc, MISTC, MBIM, G4AJJ
Zone B J Allen, G3DOT
Zone C J Greenwell, AMIEE, G3AEZ
Zone D P E Chadwick, G3RZP
Zone E E J Case, GW4HWR
Zone F J T Barnes, GI3USS
Zone G I D Suart, GM4AUP

HONORARY OFFICERS
Audio Visual Library co-ordinator: R G Auckland, G2PA
HF Awards manager: S Emlyn-Jones, GW4BKG
VHF Awards manager: Ian L Cornes, G4OUT
Chief morse test examiner: A N Ianson, G3GDO
HF manager: E J Allaway, G3FKM
Microwave manager: C W Suckling, G3WDG
Trophies manager: Mrs M H Claytonsmith, G4JKS
VHF manager: O Buller, G4ASR
Society historian: G R Jessop, G6JP
Intruder Watch (IARUMS): Stan Cook, G5XB

Correspondence to honorary officers should be addressed directly to them (OTHR), not to RSGB HQ

ANNUAL SUBSCRIPTION RATES
Once-off joining fee: £1.50
Corporate members: UK and overseas (*Radio Communication* by accelerated surface post): **£25.00**
UK associate member under 18: £8.50. Family member: £9.95
UK students over 18 and under 25: £12.75 (Applications should give applicant's age at last renewal date and include evidence of student status)
Affiliated club or society/registered group (UK): £25.00 (including *Radio Communication*): **£14.95** (excluding *Radio Communication*) (Subscriptions include VAT where applicable)

Membership application forms available from RSGB HQ

COUNCIL BRIEF

13 January 1990

• John Case, GW4HWR, was elected EVP for 1990.

• The Secretary discussed with Council the importance of future planning for the World Administrative Radio Conference in 1992 and the significance of the April 1990 IARU Conference as a prelude to WARC 1992.

The Society's future frequency policy plan was discussed in connection with the forthcoming IARU Conference and WARC 1992. General future strategy, committee reporting structures and the possible streamlining of committee work was also discussed.

The composition of the Society's delegation to the forthcoming IARU Conference in Spain was agreed by Council.

In connection with WARC 1992, the Secretary would write to the DTI offering support from the RSGB at the 1992 Conference.

• It was agreed that G3HCT would remain the Chairman of the Licensing Advisory Committee for a three-year period.

• The large amount of volunteer support generated by the "help" postcards was discussed. Council wished to thank those members who had volunteered to assist the Society.

• The Honorary Treasurer discussed the accounts to the end of October 1989 which had been generated in conjunction with the new external accountants.

The Honorary Treasurer informed Council of the situation regarding VAT, and a statement for publication in the February edition of *RadCom* was agreed.

The future auditing requirements of the Society were discussed and the Honorary Treasurer and Secretary were instructed to seek a meeting with Moores & Rowland.

The Secretary described in some detail the progress which was being made with regard to the new chart of accounts and the installation of the new integrated accounting software. This additional work, together with the training which was required, was throwing a temporary additional load on senior staff.

Increasing costs in the production of *RadCom*, due mainly to the cost of freelance work, was discussed. Council agreed that these costs must be reduced as soon as possible.

• The abuse of the GB3NA repeater was discussed further. Reports of the continued use of bad language by one or two individuals was viewed with deep concern by Council. Proper evidence of such abuse was now necessary.

A small number of messages on the packet network were considered by Council to be quite inappropriate to the airwaves. The Packet Working Group and Licensing Advisory Committee were asked to work on revisions to the bulletin guidelines. The need to strengthen the AROS and appoint a new coordinator was emphasised.

• Alan Dearlove, G1WZZ, the Chairman of the EMC Committee, attended the meeting to brief Council on the RSGB response to the recent DTI consultative document on EMC. Details of the DTI consultative document and its possible implications had been sent to all *RadCom* advertisers.

• Work on the Novice Licence was continuing towards a conclusion. Project YEAR work continued on many fronts.

• Other matters discussed included: RAYNET, RSGB, attendance at external events in the UK, various awards and trophies, the Membership Liaison Committee, the importance of local self-help and the harmonisation of the Licence Syllabus in Europe.

QSL Bureau New address

The RSGB QSL Bureau has moved to our Headquarters at Potters Bar. Please do not send cards to G3DRN. The new address is:- PO Box 1773, POTTERS BAR, Herts, EN6 3EP, England.

See page 26 for the full story.

VHF Convention

There is still some confusion over the date of the Society's popular annual event, the VHF Convention. Unlike previous years, it is being held on a *Saturday*. The date is 12 May and full details can be found on page 23.

Committee Vacancy

The **Repeater Management Group** is looking for a **Minutes Secretary** with immediate effect. Applicants need not be repeater experts but must have a good command of English and be able to attend almost all of the 6 or 7 meetings held by the RMG each year. Use of a word processor is highly desirable.

Further information is available by writing to the Chairman, Geoff Dovar, G4AFJ, who is OTHR.

(More Society news on p11)

IARU Region 1 Conference opened by ITU Secretary General

"The international telecommunications Union has more than an official relationship with the International Amateur radio Union. Amateur Radio and radio amateurs are important genes of telecommunications, shaping much of its development and character the world over. Moreover, the extraordinary fraternal spirit and universality of amateur radio is felt in the negotiations at many international conferences as a force for mutual understanding and co-operation. Friendships and global insights of amateurs have long bridged national and regional boundaries".

These are the opening words of Dr Pekka Tarjanne, the new Secretary General of the International Telecommunications Union when, last month, he opened the IARU Region 1 Conference in Spain. The fact that the ITU Secretary General attended this important conference on amateur radio is significant. Dr Tarjanne went on to say that in the context of radio the word "amateur" meant something different, "more serious than the usual dictionary definition". He said that "the amateur radio community is known as highly disciplined, self regulating in many countries and immensely knowledgable" and that "the training and experience of young amateurs has seeded important pioneering in telecommunications and information technology".

Dr Tarjanne went on to give the delegates from 41 national radio societies in Region 1 some insight into the future. He said that the ITU was "preoccupied with the changing environment in telecommunications" citing as "the primary force of change the increasing globalisation of economic activity with its dependence on information, the entry of many new telecommunications institutions and services with close links to international commerce, and the development of many new services and means of delivery".

All of these changes within the telecommunications environment will have a significant impact on the ITU. A problem which Dr Tarjanne said would require the ITU to study its own organisation, management and working methods.

WARC 92

Obviously, delegates to the IARU Conference were keen to hear what the Secretary General had to say about the next major World Administrative Radio Conference (WARC) which will take place in 1992. He said that "possible extensions to the HF frequency spectrum allocated to broadcasting will be considered" - all HF operators take note - also that "reallocation in the frequency range 1 to 3 GHz will be considered to provide necessary spectrum for mobile-satellite and other mobile services, including future public land mobile telecommunications and possibly satellite sound broadcasting". He added that "future use by the fixed satellite service of bands near 18 to 20GHz and 27 to 30GHz will be considered". "A worldwide band for satellite high-definition TV is expected as well as the associated HDTV feeder link band". Dr Tarjanne said that "some 30 other questions are in a draft agenda" for the conference.

The ITU Secretary General noted that "things went fairly well for amateur radio at the last major ITU frequency allocation conference". "The allocation of new amateur bands was seen to be important and was agreed in an environment of intense competition with other services". He said that "there will be competition again in 1992" and in 1993 when there will be another World Conference to deal again with HF broadcasting matters. He said quite clearly that "these WARCs, especially WARC 92, once more challenged amateur radio on the international conference front".

Dr Pekka Tarjanne, Secretary General of the International Telecommunications Union, who opened the Torremolinos Conference.

Project YEAR philosophy confirmed

The Secretary General's speech at Torremolinos was most informative. He is clearly in tune with all facets of amateur radio and recognises one of its most fundamental benefits, that of providing a breeding ground for future generations of people who are conversant with telecommunications and information technology. In that he has confirmed the RSGB's Project YEAR initiative. His insight into WARC 92 has helped the IARU and those who are preparing for 1992 within national societies all over the world.

We can be proud that the new Secretary General has taken an early opportunity to become involved with a major amateur radio conference, but the amateur movement cannot rest on its laurels. If radio amateurs all over the world wish to maintain the privileges of access to the frequency spectrum, which they are accustomed to, they must be prepared to support the work of the national societies, and through them the IARU.

Salute

We salute that work of the ITU and its Secretaries General who have all recognised the value of amateur radio for the important role that it has in the world of telecommunications.

David A Evans, G3OUF

There will be a full report next month on the decisions taken at the IARU Region 1 Conference.

NEWS & REPORTS

First success for North Pole 90 team

Dr Mike Stroud demonstrating the use of a sledge as a canoe on the Thames at Westminster Pier.

Explorers Sir Ranulph Fiennes and Dr Mike Stroud have achieved their first objective in their attempt to reach the North Pole unsupported. On 2 April they had reeched 85° 9.4' North and 98° 04' East. This breeks the record of 84.48° North for an unsupported Pole attempt set up by Renulph and Mike in 1986. Interestingly, because they have walked from Siberia they had to travel 229 miles to get this far North; when they set the record they started from Canada and walked only (!) 107 miles.

They have had to put up with temperatures of minus 40° Celsius, winds of up to 50 knots and zero visibility. They have had to cross a lot of open water where they use their sledges as canoes. For a long time the currents were working against them, but during late March these changed and provided assistance. By the end of March, Mike and Ranulph were walking between 11 and 15 miles a day. At that rate they will get to the Pole within their scheduled 45 days.

Morag Howell, GM0MUV, moved to the forward base camp with two Russians - Dimitry Kontin and Sergei Malachev and commenced emateur radio operation using the callsign UA0/GB4ICE. The Srednly Island bese camp, UA0/GB4MSS has made over 1000 contacts despite considerable magnetic disturbence to the lonosphere. 50MHz had not yielded any two way contacts at the time of writing although an OH station has been heard. Radio and visual auroras are experienced almost deily.

The Multiple Sclerosis Society has been delighted with the response to the Research Chair Appeal. Don't forget that sponsorship forms are available from RSGB HQ. Pleese send an SAE marking your envelope "MS Research Chair Appeal".

Radiocommunications Agency

The Radiocommunications Division of the Department of Trade and Industry was launched es an Executive Agency by Secretary of State Nicholas Ridley on 2 April 1990.

The new Agency will be responsible for radio spectrum management and frequency allocation, enforcement of the Wireless Telegraphy legislation though the Radio Investigation Service (RIS), International negotiation on redio matters and licensing of radio equipment. In short, all of the things done by the old RD.

Council Member, Hilary Claytonsmith, G4JKS, represented the Society et the official launch of the RA which was attended by all sections of the radio industry.

In his address, Mr. Ridley noted that this was the seventh DTI agency to be launched and now half of the DTI is working within agencies. This would prove beneficial in terms of effectiveness and quality of service. He hoped that working as an agency, licences would be delivered more quickly and stressed thet the Agency would be working towards increased efficiency. He noted that demands had risen and that the Agency would have to face pressures on the use of the spectrum with cellular and cordless radio, as well as a new TV channel. Mr. Ridley mentioned trunked privete radio services in the lower sub bands of Band III and

Secretary of State Nicholas Ridley.

announced that five operators had been granted licences in London; one dealing with hand portables only.

Mr. John Michell, the Chief Executive of the Radio Communications Agency, thanked Mr. Ridley for launching the Agency. He specifically mentioned the people working within the Radio Investigation Service end the fact thet they were not present. He called on Mr. Ridley to sign a special message to ell officers in the out-stations which was instantly faxed, thus including them in the proceedings. Mr. Michell said he was hoping to avoid an increase in licence fees during the period 1990/1991 - this went down very well with those present.

After the cutting of the celebratory cake, the assembled company edjourned to a reception and pleasant conversation with other users of the radio spectrum.

The Main Aims of the Agency

1) To seek to ensure that the radio frequency spectrum, the geostationary satellite orbits and other earth orbits, are used in ways which maximise their contribution to national social and economic welfare, while having regard to safety-of-life factors.

2) To seek to ensure that the maximum amount of spectrum is available for commercial use.

3) To provide an expert service to Government as a whole in the field of redio regulation.

The Objectives of the Agency

1) To ensure, through proper consultation, that its activities as far as possible, meet the needs of existing and new users in the UK.

2) To allocate and assign frequencies in weys which meet the needs of current and future users, service providers and manufacturers.

3) To ensure that authorised spectrum use is, as far as possible, free of interference end in particular of interference which could endanger life.

4) To plan and ensure future spectrum availability and efficient use of the spectrum.

5) To promote greater economic efficiency and quality of service in its operations.

6) To pursue a policy of deregulation where possible and appropriate, and in a way which minimises burdens on business, especially small business.

7) To provide an objective and independent service to other parts of Government of frequency allocation and assignment.

8) To represent the United Kingdom's interests in its international negotiations on radio metters which may from time to time be specified by DTI Ministers or the Deputy Secretary responsible for telecommunications and radiocommunications.

9) To contribute to the efficient implementetion of the EMC Directive.

1990 Call Book

Details withheld

Those who have already purchased the 1990 edition of the RSGB Call Book - packed with information and only £8·46 by post to members - will have noticed that in most cases the complete withholding of information on location is now a thing of the past.

In all cases where a licensed emeteur has provided a post code to the RALU - some have not - the first two letters of the post code have been supplied by the RALU to the Society. This enables us to give the post town associated with the callsign which esteblishes the *approximate* location of the station. In our view this certainly enhances the usefulness of the Call Book.

Regional prefixes

In order to make it easier to find GD, GI, GJ, GM, GU and GW callsigns amongst the Gs, this year's Call Book has a space inserted between the prefix and suffix. It is hoped that this has none of the pitfalls of some of the alternative suggestions.

(*More News & Reports on p10*)

Closing Date 31 July 1990

YOUNG AMATEUR OF THE YEAR 1990

Every RSGB member and affiliated club is urged to sponsor a person under 18 for the 1990 Young Amateur of the Year

The Radiocommunications Agency of the Department of Trade & Industry has announced its sponsorship of the Young Amateur of the Year Award for 1990's outstanding achievement by a young amateur radio enthusiast.

Anyone who is under 18 and;

- is keen on DIY radio construction; or
- is interested in using radio and gaining operating skills; or
- is using radio for community service, such as helping the disabled or in emergency communication networks; or
- is good at encouraging interest in amateur radio; or
- is involved in amateur radio in any way such as in a school scientific project,

is eligible for the 1990 Award and its £250 cash prize.

The prize, for the most outstanding achievement between 1 April 1989 and 31 July 1990, will be awarded by the DTI and presented at the Radio Society of Great Britain's 1990 HF Convention on 30 September 1990.

The closing date for applications is 31 July 1990. Entrants do not need to be a radio licence holder to enter and the competition is open to anyone in the UK, the Channel Islands, or the Isle of Man, who is under 18 on 31 July 1990.

Through its sponsorship of the Award, the DTI is encouraging young people to become involved in amateur radio which gives invaluable 'hands-on' experience for anyone considering a career in radio electronics. It complements part of the RSGB's education and training initiative 'Project YEAR' which aims to introduce more people into the hobby, and the Agency's Enterprise and Education initiative which encourages young people to gain the skills, aptitudes and abilities they will need for the world of work.

ENTRY FORM IS IN THIS ISSUE!

Entry forms for the award (enclosed as a loose leaf insert with this issue) must be sent to; The Secretary (YAOTY), Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, EN6 3JE, NO LATER THAN 31 July 1990.

Ted Walker, G0KAQ, 1989 Young Amateur Of The Year

Ted Walker, G0KAQ, has just turned 17 and is enjoying his year as YAOTY. It started last September when he won the DTI's award of £250 (some of which has already gone towards enhancing his station) and a number of other prizes, including an RC14 receiver from the RSGB currently on loan to a 13 year old who is studying for the RAE.

Ted Walker, G0KAQ, receiving the Award from Mike Coolican of the DTI last year

MORE PRIZES

The DTI took Ted on a guided tour of their Monitoring Station at Baldock, which he found both enlightening and enjoyable. He confesses to being very envious of Baldock's Racal gear and aerial farm. UK manufacturers Navico presented him with a VHF rig and showed him round their factory which produces amateur radio and marine equipment. Ted is now operational on packet radio, thanks to a TNC awarded him by Siskin Electronics.

AMBASSADOR

As YAOTY, Ted has been a wonderful ambassador for amateur radio and has passed on his knowledge and enthusiasm to other youngsters. He has given a talk to a Rotary Club, and at a local school his demonstration of HF operation fascinated a group of 11-year olds.

SCHOOLS NET

Ted attends Warwick School whose radio club holds the callsign G4WKS. He has started a schools net (1340 local time every Tuesday during term time, 7050kHz SSB) and is anxious to involve more schools. The club has several studying for the RAE and they are ready and eager to train youngsters for the Novice Licence.

GUIDES ON THE AIR

Banding together — Scouts

Once again the scouting movement and amateur radio

During the year, youngsters all over the world have an opportunity to experience amateur radio, many for the first time, and of realising just how close it brings them to those with like interests, namely guiding and scouting. Thinking Day on the Air and Jamboree on the Air are two events which highlight this radio fellowship. It should be particularly encouraging for us as radio amateurs when we see such overwhelming enthusiasm shown by guides and scouts on these two weekends.

JAMBOREE ON THE AIR

High winds again swept parts of the United Kingdom during Jamboree on the Air, October 1989. Radio conditions were also variable, with an aurora creating havoc on 144MHz. The HF bands suffered from fade out early on, but improved later in the weekend. Until last year, Scouts could send greetings messages over the air to stations in only four countries. Several months before JOTA, the RSGB made an approach to the DTI, who wrote to all 189 radio administrations in the world. This requested bilateral greeting message facilities for the JOTA weekend. The replies were still flooding in as JOTA commenced. By the start of the event some 32 countries had agreed but the final total could well be over 100! Hundreds of scout troops around the UK took advantage of this privilege, operating from a variety of venues - in tents, village halls, schools and scout headquarters. One group from Harrogate - Spectra VSO and 20th Harrogate Scouts embarked on their annual quest to place a radio station on Great Whernside. All went well until on reaching the summit they discovered that they had no guy ropes. This sort of occurrence only added to the fun, although at the time it did not seem that way.

Some chance encounters were made on the air-waves, which turned an already fascinating weekend into an even more memorable one for some groups. The 1st Williton Scouts in West Somerset enjoyed impromptu conversations with a 300-strong scout camp in the Natal region of South Africa.

The 1st Scarborough Scout Troop, with the help of Scarborough ARC, had an unexpected contact with VR6TC, Tom Christian, a descendant of Fletcher Christian of "Mutiny on the Bounty" fame. Their venture scout leader spoke to Tom Christian, telling him about scouting activities in Scarborough and the First Scarborough venture unit.

The District Commissioner of the Fakenham Scouts is serving with the RAF in the Falkland Islands and the scouts were hoping to contact him over JOTA weekend.

Other troops had visits from dignitaries. The 1st Godmanchester Scouts were joined by the Mayoress who enjoyed passing a message over the air.

The 25th Chester Scouts and Guides Troop entertained the Mayor and Mayoress of Chester and told them all about JOTA.

As a result of these weekends many scouts have embarked on working for their communications badge. Last year ten Northampton Scouts were given their amateur radio badges at a special party which celebrated eight years of the Billing Lane Scout station. More than 200 boys have completed the course since the amateur radio station opened in 1981. To gain the badge, the scouts have to keep a log of amateur radio contacts, learn about how radio actually works and know about licensing conditions.

Each JOTA station organiser who put scouts in touch with others in the movement in far-flung parts of the world deserves praise. Not only will they have sown the seeds of interest in electronics and amateur radio, but also made the youngsters aware that scouts in Vancouver or Moscow are pretty much the same as those in Paisley or Wrexham.

and Guides get on air

come together — Hilary Clayton-Smith, G4JKS, reports.

THINKING DAY ON THE AIR

Since the inception of Thinking Day on the Air the number of guide units taking part and showing a real interest in amateur radio has increased. This February there were 150 stations on the air. In the past the North West has fielded the largest number of interested groups - this is levelling out now. This year there was an increase in activity in Scotland. Interest in radio is kept alive during the year as guides and brownies can work towards their Radio Communication Interest Badge (details in May 1989 *RadCom* pp 11 & 12).

Guides take a great deal of interest in construction, with groups reporting that the girls had made morse oscillators and receivers during the weekend. Seventy four Harpenden guides at GB0HGG each built an AM receiver and were fascinated when they found they could tune into the local radio stations.

Conditions on HF over the weekend were poor, with much noise reported on the LF bands. They also had a French contest to contend with. In spite of this GB0HDG in Horsham managed to contact VK4MBJ and now the girls are swapping badges, photographs and letters.

One blind member of the Congleton Brownies had a great time tuning in stations and working others in a very clear and confident voice.

Guides in Norfolk working at GB2NGR sent messages on packet radio and were pleased to link up with SV1EM. Georgina Stanley, G7GMS, showed initiative by making all the arrangements for the station licence, camping facilities, and food and even got seven girls interested in working towards their Communications Badge. Georgina, who was 14 in December, is busy trying to encourage her friends in the Nottingham area to take up amateur radio.

The guides on the Isle of Man were pleased to have a visit from the Island's Commissioner who sent a message to a guide station in Kidderminster.

The station of GB2SWG in Sandridge, near St Albans, was organised by G0EVD and run by him, with help from the members of the Verulam ARC.

During the weekend 69 girl guides were put on the air for which they received, as a memento, a special certificate as well as a copy of the RSGB's *DIY Radio*.

Novice Licence News

As we went to press tha Radiocommunications Agency announced more details of their plans for a UK Novice Licence and issued the draft text of the Novice Licence itself. Key points ere:-

- The RA plan to introduce the Novice Licence within 12 months; more work needs to be done on the licence, the training course and multi-choice exam.
- Ministars recognize the value of amateur radio as a training ground for careers in electronics and radio engineering.
- There will be two Novice Licences - Class B which permits operation on segmants of 50 MHz and 430 MHz bends plus 1.3 GHz and 10 GHz. (The latter will permit classroom experiments). On passing a 5wpm morse test, Novices will be permitted limited operation on 1.8 MHz, 3.5 MHz, 10 MHz, 21 MHz end 28 MHz.
- Maximum power output will ba 3W (or 5W dc input).
- Novices will not be permitted /MM, ba abla to work with user sarvicas or share the CEPT operating privilege.
- The entry qualifications are attendance and complation of a training course which tha RSGB intands to provide, followed by a multi-choice axamination. For HF oparation a 5wpm Morse test must be passed.
- There will be no minimum age; the tasts will determine who may hold a licence.
- Holders of Class B licances for over 12 months will be grented the HF novice lacilities on completion of a 5wpm Morsa test.

We expect to bring you more details, including a list of bands and modes which have been agreed, in next month's magazine.

Awards news

Ian Cornes, G4OUT, the RSGB's VHF/UHF Awards Manager tells us that two naw categories of award hava bean introduced to the RSGB's VHF/UHF award scheme. Tha award stickers are worded *"Achieved during the first year of being licensed"* and *"Achieved while under 18 years of age"*. The rules for thesa awards are the seme as for the other RSGB VHF/UHF awards axcapt that the OSLs must show that the contacts were made in the appropriate time scale. Applicents must also include information on date of birth or date first licensed as appropriete.

In December 1989, a 1296MHz Stendard Transmitting award was issued to Howard Steddon, G6STI, which, togelher with Howard's 144MHz Senior and 432MHz Senior, quallfied him for the RSGB Suprame award.

Douglas Byrne, G3KPO (RSGB RLO for the Isle of Wight) pictured (right) at the 30th Tropical Hamboree in Miami which was attended by over 6000 people. Also in the photo are (l to r) Larry Price W4RA (ARRL President), George Wilson W4OYI (ARRL Vice-President), Evelyn Gauzens W4WYR (Chairman Torpical Hamboree), Frank Butler W4RH (Director ARRL SE Division).

Nail Carr, G0JHC, gained tha first 50MHz 100 squares award, lhe first 50MHz 50 countries DX award, and tha first 50MHz 50 countries 2 way awerd.

Ela Martyr, G6HKM, has recently quallfied for a formidable array of awards - 50MHz 20 countries two way, 50MHz 30 countries, 50MHz 75 squeres, 50MHz DX 25 countries, 144MHz 175 squares / 20 countries, 432MHz 90 squares / 15 countries and 1296MHz 30 squares.

Ruth Davies, GW1EHI, was issued with tha 50MHz 10 countries award and the 50MHz 25 square awerd while xym Jeff Davies, GW0ETM, clelmed certificates for 50MHz 20 countries two way end 50MHz 50 squeres.

Still with the ladies, Sue Squibb, G1TZU, received tha 50MHz 10 countries and 50MHz 25 squares awards. Batty Jackson, G1YNR, claimed 50MHz 75 squeres nr 2.

During February, the first epplication was received from an ovarseas amateur, epplying under tha naw award rule. Howard A Sine, WB4WXE, was awarded 50MHz 10 countries and the 50MHz 25 squeres certificates. Ian was pleasantly surprised to receive Howard's application as he used to contact him regularly 8 years ago when Howerd was in Alaska.

Norman Vincent, G3NVO, entered the award register with a notabla 200 squares and 30 countries confirmed on 144MHz.

The Scottish flag wes kept flying by Philip Hughes, GM1ZCD, who obtained tha 50MHz 10 countries, 50MHz 25 squares award and 50MHz 50 squares awards.

In March, John Arnold, G4NPH received the 432MHz 60 squares / 15 countries award.

GC45LD

Tha Jersey Amateur Radio Society has been granted permission by the DTI to use tha very special callsign GC45LD to commemorate the 45th Anniversary of the liberation of tha Channel Islands. The station will be operational from 5 to 18 May.

Loony eclipse

How many readers spotted that tha April *RadCom* story about moonbounce tests wes a spoof? Peter Blair, G3LTF, is thanked for agreeing to land his nama to tha piece to add authenticity.

Historic radios in use

The Norsk RadioHistorisk Foraning will be using tha special call LA1D on 5 May from the War Museum in the Akerhus Fortress, Oslo. Operation will be on 3510kHz from 0700 to 0900 UTC and on 14055kHz from 1000 to 1200 UTC. Historic equipment will be used including OLGA, the Norwegian "suit-casa" radio end a B Mk II. Tha Museum has a fine collection of Allied and Garmen radio gear as well as radar, artillery and other more usual items.

The Freedom Museum in Copenhagen will be using its call OZ5MAY from 5 May (Freedom Day) to 7 May. This well known stetion has made over 3500 OSOs using a B Mk II with a Zepp antenna in the trees of Churchill Perk. Operation is from 0900 to 1600 UTC mainly on 40m and 20m.

RAF Duxford Radio Society will be operating B Mk II and other sets on 5 and 7 May using the special callsign GB2IWM. The schedule is 0900 to 1000 UTC on 40m, 1000 to 1200 UTC on 20m, 1200 to 1500 UTC on 40m then on 20m until the station closes. Calling frequencies (crystel controlled of course) are 7027, 7030 and 14065kHz, and working frequencies are 7025, 7024, 7020, 14054 and 14050kHz. Members of the B2UG, the B Mk II User Group will be taking part in a first meeting, commemorating Special Forces world-wide.

BATC Convention

The British Amateur Television Club hofds its annual convention on Sunday 6 May at Herlexton Manor, near Grantham, Lincs. There will be a trade exhibition and a lecture stream.

AMSAT-UK Colloquium

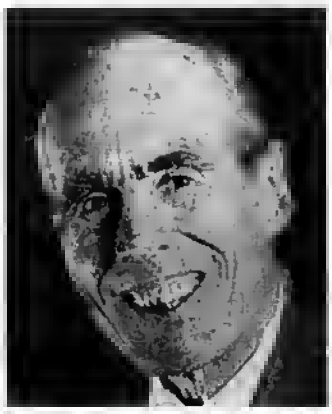
This popular event will taka placa at the University of Surray from 26 to 29 July. All enquiries to Ron Broadbent, G3AAJ, OTHR.

3rd RSGB Data Convention

The 1989 event was held alongside the AMSAT-UK Satellite Colloquium. It is not possible to combine the two events this year and alternative plens are being mada. All enquiries to Ian Suert, GM4AUP, OTHR.

RAIBC picnic

Tha Annual Picnic of tha Radio Amateur Invalid and Blind Club will be held at its usual venue et Romsey on Sunday 8 July. Further details can be obtained from John Compton, G4COM, Aysgerth, Beech Comer, Durley, Southampton, SO3 2AR. Telephona 0703 693017.



Gp Capt Leonard Cheshire VC, Patron of the RAIBC, is expected to attend the picnic at Romsey.

Banned from London Repeaters

Tha following letter from tha Head of Branch (Licensing) at tha DTI has been received by the Society. It was addressed to the President, Frank Hall, GM8BZX.

I am writing to let you know that I have had to write to three Amateur Radio Licensees to advise them that, after careful consideration, the Secretary of State has decided to vary their licences to preclude use of the London repeaters. A fourth person whose licence has lapsed has been advised that it will not be renewed without a clause excluding use of the London repeaters.

The reasons for this decision are that those concerned behaved irresponsibly in the use of radio by sending messages whilst pursuing a personal dispute which included offensive material, which was likely to be heard by other radio users, and by making use of the London repeaters for periods of time so prolonged as to disregard the rights of other users of amateur radio.

The Secretary of State regards these matters as serious. I have to say that they tend to call into question the fitness of some licensees to hold an Amateur Radio Licence. The Secretary of State has no desire to withdraw or restrict the right to use amateur radio for any licensee, but will take action where the abuse of radio and interference with the rights of other radio users make it necessary. I am writing to you, in your capacity as President, to make it clear that if any licensee does not use amateur radio responsibly in future, their licence may be revoked, or varied to further incorporate restrictions on use.

I do hope that you will give this letter, and the very clear warning it contains, the very widest possible circulation among radio amateurs. I do not want any radio amateur licensees to be under the slightest illusion about our readiness to act vigourously and forcefully against the irresponsible minority who spoil the enjoyment of other licensees.

The Department's efforts must be complemented however by those of the amateur community itself. It is important that the amateur world accepts its share of responsibility for maintaining high operating standards. I am sure that the vast majority of amateurs view the activities of an irresponsible minority with deep distaste. I took to the RSGB to do all it can to encourage high operating standards and to discourage the type of behaviour that is bringing the hobby into disrepute. Self discipline has traditionally been one of amateur radio's outstanding features and we should like to see this approach maintained.

As the licensees of these repeaters I know you are only too well aware of the problem which is receiving the Society's attention.
Yours sincerely
M V Cootican
6 March 1990

This letter gives the clearest of warnings that the Radio Investigation Service of the new Radiocommunications Agency is prepared to act against those who abuse their Amateur Licences. It also underlines the need for the amateur community to carry out a substantial degree of self policing. This doesn't mean "leave it to RSGB HQ". There is much the Society does and can do in order to encourage the highest operating standards. However, each amateur who knows a bad, irresponsible or just inexperienced operator is in a position to influence that person to the good. Teaching by example is another very positive step which every amateur can take. It is not good enough to simply to condemn repeater jammers if, for instance, you deliberately jam someone who is in breach of the bandplans, or use the packet mailbox network to abuse other amateurs. It is the direct responsibility of all radio amateurs to operate to the highest standard and to seek to improve that standard.

GB3BM

Owing to illegal operating practices by a tiny but vociferous number of users, the central Birmingham VHF repeater was turned off for a few weeks by the local repeater group. This was in order to provide for a cooling off period during which the group discussed with the RSGB's Repeater Management Group ways of ensuring that the illegal operators are brought to book.

G7GBH pirate

RSGB Member G7GBH discovered recently that his callsign is being pirated on VHF in the West London and Herts area. If anyone has any information about this station, would they drop a line to the Amateur Radio Observation Service at RSGB HQ.

Raynet Elections

Zones 5, 8 and 11

The following nominations have been received in response to the notice which appeared in the February issue of *Radio Communication*.

- Zone 5 (Greater London) - one valid nomination received in favour of Ian Jackson, G8RWH.
- Zone 8 (Wales) - one valid nomination received in favour of David Davies, GW0KWY.
- Zone 11 (Northern Ireland) - one valid nomination received in favour of Ian Gibson, GI4MDD.

Messrs Jackson, Davies and Gibson are therefore elected unopposed for a three year term of office as Representatives for their respective Zones.

Zone 4

The February issue also called an election in Raynet Zone 4 (East Anglia). The following votes were received:-
Chris Rutt, G0AMG, 28 votes;
John Slater, G6EUO, 52 votes;
Spoiled votes, none;
Invalid votes, one.

John Slater, G6EUO, is therefore elected as the new Zone 4 Representative.

Zone 9

Two valid nominations have been received for this vacancy:

Mr Charles Bottome, G4PIP (Warwickshire), nominated by Martin Harrison, G3USF (North Staffs), Madeley Smith, G8KVU (Coventry), John Bazley, G3HCT (Warwickshire), Henry Pinchin, G3VPE (Solihull), and Brian Jones, G8ASO (Mid Severn Valley).

Mr Don Sunderland, G6FHM (Shropshire), nominated by Syd Poole, G3IMP (Shropshire), Chris Hughes, G0DOW (Shropshire), Dave Hall, G8VZT (Shropshire), Ken Walker, G8DIR (Shropshire), and Denzil Jones, G1DMJ (Shropshire).

Any current Raynet member registered in Zone 9 (Hereford and Worcester, Shropshire, Staffordshire, Warwickshire and West Midlands) may record his or her vote for one of the above candidates in the following manner. No special ballot paper is required. The text of the vote should clearly indicate which candidate is preferred. Please do not include any other correspondence in the same envelope. On the back of the envelope, which must be sealed, write in capital letters your name and callsign. The envelope must be addressed to "The Secretary (Raynet Zone 9 Election), RSGB, Lambda House, Cranborne Road, POTTERS BAR, Herts, EN6 3JE". It must be received at RSGB HQ by 5.15 pm on Thursday 30 May 1990.

The election result will be announced on GB2RS, the Raynet Sunday Net, and in *Radio Communication*.

Direction finding

The RSGB Council has recently agreed to the formation of a **Direction Finding Committee**. The task of this new committee of Council will be to promote all facets of direction finding in the UK. It will not only promote UK 1.8MHz and 144MHz direction finding competitions but will also promote the IARU style of events on the 3.5MHz and 144MHz bands. The latter are almost certainly going to be popular with young people, and already the Society is talking to the Scouts Association about ARDF rules and equipment.

Any member of the Society who has a particular interest in direction finding is asked if they would like to join this new committee. If you are keen to join, please could you write to the new Chairman of the committee, Mr B.M. Bristow, G4KBB, at "Camelot", Princes Street, Piddington, High Wycombe, HP14 3BN **Note: This supercedes the information on page 59.** Please give details of your experience and interest in direction finding.

RLO elections - save your *RadCom* address labels

The current terms of office of all RSGB Liaison Officers (RLOs) expire on 31st December 1990, and elections will take place later this year.

Full details of the elections, which will be administered on behalf of Council by the Membership Liaison Committee, will be published in next month's *RadCom*.

Corporate members who may wish to participate in the RLO elections, either as a candidate OR as a nominator, should save the address label from the May or June issue of *RadCom* as it will need to be attached to the nomination form as proof of membership.

Calling all schools and colleges

by Hilary Claytonsmith, G4JKS

As Project YEAR Coordinator, I am trying to locate all colleges and schools in the UK which are involved in any way with amateur radio.

If you are a teacher, pupil or parent who knows of the existence of amateur radio clubs in a school or college, or of any groups meeting informally within educational establishments to promote amateur radio, please write to me.

I need the following information:-

- Name and type of school;
- Address including county;
- Number on roll;
- Type of amateur radio activity pursued;
- Number of licensed amateurs involved (identify those who are students)
- Also mention any amateur radio achievements which may be of interest to the RSGB, along with any photographs, publications etc which may be of use.

My address is:- 115 Marshalswick Lane, St Albans, Herts, AL1 4UU.

HF Trophies Presentation

Ron Glaisher, G6LX, does the honours at the 1989 RSGB HF Convention

Northumbria Trophy: G3WAS/P (Lichfield ARS)

1930 Committee Cup: G3JKS (Frank Claytonsmith)

G6ZR Memorial Trophy: G5LO/P (Oxford & DARC)

G3XTJ Memorial Trophy: G3KHZ (D Cox)

Gravesend Trophy: G0AAA/P (Three A's Contest Group)

HF NFD Shield: G3VMW/P (Marple Contest Group)

Southgate Trophy: G4ARI/P (Tim Raven)

Whitworth Trophy: GW4BLE (SR Cole)

Edgware Trophy: Leicester Polytechnic ARS 'A'

Powdlich Trophy: G3FXB (Al Slater), who also received the Col Thomas Trophy

Houston-Fergus Trophy: G4JKS/P (Hilary Claytonsmith)

Frank Hoosen Trophy: G3YDD/P (Hereford ARS)

Braalen Trophy: G4BUO (Dave Lawley)

G2QT Cup Winners Cup: G4OBK (Phil Catterall), who also received the Somerset Trophy.

Verulam Silver Jubilee Trophy: G3NKS (Derek Thom)

Bristol Trophy: G3VER/P (Verulam ARC)

HRS Electronics

STILL IMPORTING ALL

MFJ

MFJ's *Fastest Selling* Tuner

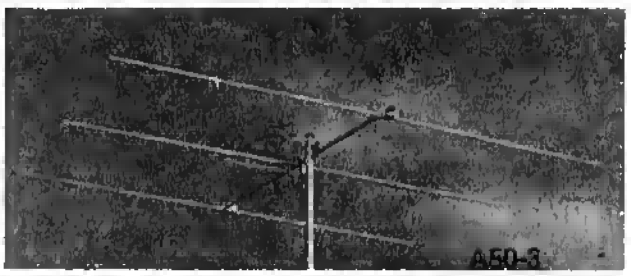
MFJ901B	200W A.T.U.
MFJ910	Mobile matcher
MFJ941D	300W versa tuner (A.T.U.)
MFJ949D	300W versa tuner c/w cross needle peak reading meter and dummy load
MFJ962C	1.5kW versa tuner c/w cross needle peak reading meter and dummy load
MFJ986	3.0kW roller inductor tuner
MFJ989C	3.0kW versa tuner c/w cross needle peak reading meter and dummy load
MFJ16010	200W random wire tuner
MFJ931	Artificial RF ground
MFJ815	Peak reading cross needle 2k meter
MFJ840	5 Watt 2M Wattmeter
MFJ841	5 Watt 2M In line Wattmeter
MFJ202B	Receiver noise bridge
MFJ204B	Antenna noise bridge
MFJ206	Antenna current probe
MFJ945	300W mobile tuner
MFJ250	1kW dummy load
MFJ260	300W dry dummy load
MFJ262	1kW dry dummy load
MFJ264	1.5kW dry dummy load up to 650 MHz
MFJ401B	Econo keyer
MFJ407B	Electronic keyer sends, iambic, automatic, semi automatic and manual
MFJ422B	Electronic keyer with dash memory c/w bencher paddle
MFJ422BX	As 422B but less paddle
MFJ482B	Grandmaster memory keyer 1024 bits of memory
MFJ484C	Grandmaster memory keyer 4069 bits of memory
MFJ486	Grandmaster memory keyer 800 plus characters in 10 memories, auto S/N, etc.
MFJ722	CW/SSB filter
MFJ723	CW filter
MFJ752C	Dual tunable filter CW notch
MFJ956	LW/MW/SW preselector/tuner
MFJ959B	Receiver antenna tuner/preamplifier
MFJ1040B	Preselector 1.8-54 MHz
MFJ109	World time clock
MFJ1270B	Packet radio controller
MFJ1274	Packet radio controller
MFJ1278	Multi-mode data controller
MFJ1286	Gram line software
MFJ1281	Easy-DX DXCC log/terminal programme/packet cluster interface

BUTTERNUT

HF2V	80 and 40M vertical
HF5B	Two element compact beam for 20, 15, 12 and 10M
HF6V	6 band vertical
A17-12	17 and 12M kit for HF6V
TBR160S	160M add on for HF2V and HF6V
TLK	Top loading kit for HF2V
30MRK	30M add-on for HF2V
20MRK	20M add-on for HF2V
STR-11	Stub-tuned radial kit for HF6V
RMK	Roof-mount kit for HF6V, includes T2, MPS, STR-11 and hardware
T2	2ft tripod tower accepts – masts up to 1½"
MPS	Mounting post sleeve HF6V
2MCV	2M vertical 3DB
2MCV-5	2M vertical 5DB
SC3000	30-512MHz scanner
BUTKK	Weatherproof sealer for R.F. Connectors 6ft x 1" roll

CUSHCRAFT

104CD	4 Element 10M beam
124WB	144-148 MHz 4 element beam
153CD	3 element 15M beam
154CD	4 element 15M beam
215WB	15 element 2M beam
A3	3 element 10-15-20M beam
A3SK	Stainless steel hardware kit for A3
A4S	4 element 10-15-20M beam with stainless steel hardware
A4SK	Stainless steel hardware kit for A4
A50-6	6 element 6M beam
A743	30/40M add-on kit for A3



A744	30/40 add-on kit for A4
APB	80/40/30/20/17/15/12/10M vertical
ARX450B	435 MHz – 450 MHz Ringo-Ranger vertical
AV3	20/15/10M vertical
D3W	10/12/17M rotatable dipole
LAC1	Coax lightning arrester
LAC4H	2kW gas tube arrester
PD2	Power divider for 2 x 215WB, 2 x 4218 x L
PD4	Power divider for 4 x 215 WB, 4 x 4218 x L
R5	10/12/15/17/20M vertical (no radials req.)
R45K	17M kit for R4 vertical
TEN-3	3 element 10M beam
425K	Stacking harness etc. For 2 x 4218 x L
ARX2B	134 MHz – 164 MHz Ringo Ranger vertical
D3	20/15/10M rotatable dipole
228K	Stacking harness etc. For 2 x 215 WB
4218XL	18 element 2M beam
124CD	3 element 30M beam
20-3CD	3 element 20M beam
20-4CD	4 element 20M beam
40-2CD	2 element 40M beam

KLM

KT34A	4 element triband beam 10/15/20M
KT34XA	6 element triband beam 10/15/20M
KLMXAKIT	Upgrade kit KT34A to XA
KLM411	4kW 1:1 ferrite balun
KLM541	5kW 4:1 ferrite balun

MIRAGE

B108	Amplifier	10W in – 80W out 144-148 MHz
B-1016G	Amplifier	10W in – 160W out 144-148 MHz
B-215G	Amplifier	2W in – 150W out 144-148 MHz
B-3016G	Amplifier	30W in – 160W out 144-148 MHz
A1015	Amplifier	10W in – 150W out 50-52 MHz
D1010N	Amplifier	10W in – 100W out 430-450 MHz
D26N	Amplifier	2W in – 60W out 430-450 MHz
D3016N	Amplifier	30W in – 160W out 430-450 MHz

H.R.S. COMMUNICATION APPROVED STOCKISTS

Alyntronics Limited
129 Chillingham Road
Newcastle-Upon-Tyne NE6 5XL
Tel: 091-276 1002

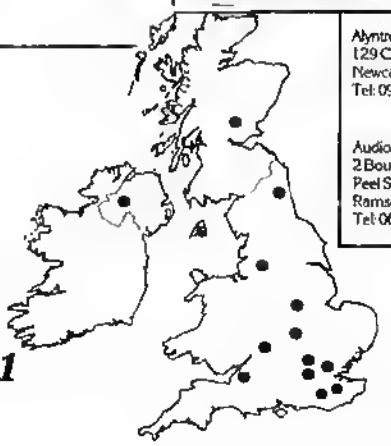
Arrow electronics
5 The Street
Hatfield Peveral
Nr. Chelmsford
Essex
Tel: 0245 381673

Bredhurst Electronics Limited
High Street
Handcross
West Sussex RH17 6BW
Tel: 0444-400786

Audio & Domestic Spares
2 Bourne Concourse
Peel Street
Ramsey Isle of Man
Tel: 0624-815889

Amcomm Service Limited
373 Uxbridge Road
Acton London W3 9RH
Tel: 01-992 5765/8

Elliott Electronics
26-28 Braunstone Gate
Leicester
Leicestershire
Tel: 0533-553293



HRS Electronics Plc

GARRETS GREEN,
BIRMINGHAM B33 0UE
TELEPHONE: (021) 789 7171

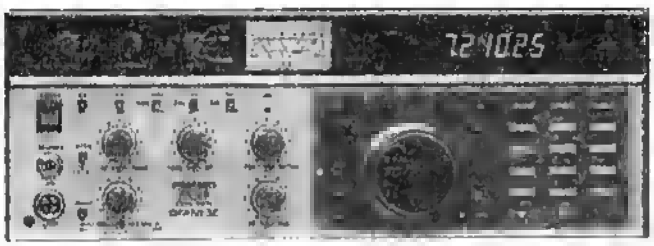
IF YOUR LOCAL DEALER IS

PHONE US DIRECT:- (021)

THE BEST FROM THE U.S.

TEN-TEC

TT585	Paragon general coverage HF transceiver 200W 1.8–30 MHz
TT961	Power supply for TT562/585
TT700C	Handheld electret microphone for TT562/585
TT705	Desk electret microphone for TT562/585
TT1140	DC circuit breaker for TT562/585
TT256	FM transceive module for TT562/585
TT257	Voice synthesizer for TT562/585
TT258	RS232 Interface for 562/585
TT562	Omni V HF transceiver 200W 9 bands
TT216	500Hz 6 pole FSK filter 90MHz for TT562
TT217	500Hz 8 pole filter 9MHz for TT562/585



TT218	1.8kHz 8 pole filter 9MHz for TT562/585
TT219	250Hz 8 pole filter 9MHz for TT562/585
TT220	2.4kHz 8 pole filter 9MHz for TT562/585
TT282	250Hz 6 pole filter 6.3MHz TT562/585
TT288	1.8kHz 6 pole filter 6.3MHz TT562/585
TT301	Remote frequency tuning control for TT562
TT604	Dual paddle/iambic electronic keyer
TT605	Single paddle electronic keyer
TT425E	Titan linear amplifier 1.8-31MHz complete with power supply
TT420E	Hercules linear amplifier 1.8-30MHz solid state
TT94210	Hercules power supply
TT238	2kW antenna tuner/SWR bridge
TT239	300W dummy load
TT240	1.5kW dry dummy load
TT253	1.5kW automatic antenna coupler
TT254	200W antenna tuner/SWR bridge
TT3110	Mobile 10M antenna 72" high
TT4112	Mobile 12M antenna 72" high
TT3115	Mobile 15M antenna 72" high
TT4117	Mobile 17 meter antenna 72" high
TT3120	Mobile 20M antenna 72" high
TT3130	Mobile 30M antenna 72" high
TT3140	Mobile 40M antenna 78" high
TT3175	Mobile 75M antenna 78" high
TT3180	Mobile 80M antenna 78" high

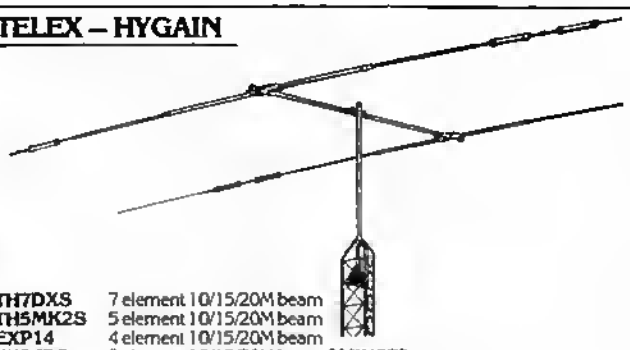
COMING SOON

***TT535**	Argonaut II QRP general coverage HF transceiver 10W SSB/CW

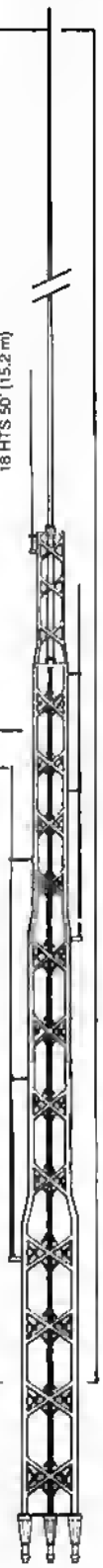
HEIL

HC4	Microphone insert
HC5	Microphone insert
HM5	2K impedance microphone
EQ300-4	Microphone equalizer
BM10K4	Boomset using HC4 insert ready wired for Kenwood
BM10K5	Boomset using HC5 insert ready wired for Kenwood
BM1014	Boomset using HC4 insert ready for ICOM
BM1015	Boomset using HC5 insert ready for Icom
B10-Y4	Boomset using HC4 insert ready for Yaesu
B10-Y5	Boomset using HC5 insert ready for Yaesu

TELEX – HYGAIN



TH7DXS	7 element 10/15/20M beam
TH5MK2S	5 element 10/15/20M beam
EXP14	4 element 10/15/20M beam
TH3JRS	3 element 10/15/20M beam 600W PEP
TH2MKS	2 element 10/15/20M beam
QK-710	30/40M add-on for Exp14
103BAS	3 element 10M beam
153BAS	3 element 15M beam
203BAS	3 element 20M beam
105BAS	5 element 10M beam
155BAS	5 element 15M beam
205BAS	5 element 20M beam
204BAS	4 element 20M beam
DISC7-1	Rotary dipole 30/40M
DISC7-2	2 element 40M beam
DISC7-3	Director kit for DISC7-2
18HTS	80/40/20/15/10M HY-tower
18VS	80/40/20/15/10 base loaded vertical
12AVQS	20/15/10 trap vertical
14AVQS	40/20/15/10 trap vertical
18AVT	80/40/20/15/10 trap vertical
14RMQ	Roof mounting kit



ROTATORS

HDR300	Heavy duty digital read out up to 25sq ft of antenna area
CD4511	Friction brake up to 8.5sq ft of antenna area
T2X	Heavy duty wedge brake up to 20sq ft of antenna area
HAM1V	Wedge brake up to 15sq ft of antenna area
AR40	Light duty up to 3sq ft of antenna area

ACCESSORIES

K100	Koyu SWR/power meter 2kW 1.8-60MHz
K20	Koyu SWR/power meter 15/50W 140-150MHz
K200	Koyu SWR/power meter 200W 1.8-200MHz
K400	Koyu SWR/power meter 200W 140-525 MHz
KS2	Koyu coax switch 1kW DC-1000 MHz S0239
DL1	Texpro 1500W dummy load
BNC1520	S0239 to BNC Adaptor
D0G1	Ceramic insulator
EGG1	Ceramic egg insulator
CC701	RFI-free chore kit
NC518	6 pin microphone plug
NC520	7 pin microphone plug
NC551	High quality PL259 connector
SA450N	Toyu 2 way coaxial switch N sockets
SA450M	Toyu 2 way coaxial switch S0239 sockets
T435N	Toyu RF thru-line watt meter 200W 145/430 MHz
YM-1E	Toyu SWR/power meter 120W 3.5/150MHz
HK702	Hi-mound key marble base
HK705	Hi-mound key ABS base
HK706	Hi-mound key ABS base
HK707	Hi-mound key ABS base
HK708	Hi-mound key ABS base
HK704	Hi-mound key ABS base twin paddle

Jaycee Electronics Limited
20 Woodside Way
Glenrothes Fife KY7 5DF
Tel: 0592-756962

KW Communication
Chatham Road
Sandling
Maidstone
Kent ME14 3AY
Tel: 0622-692773

Photo Acoustics Limited
68 High Street
Newport Pagnell
Bucks MK16 8AQ
Tel: 0908-610625

R.A.S. (Notts)
3 Farndon Gree
Wollaton Park
Nottingham
Tel: 0602-280267

Ray's ...ners
International House
963 Wolverhampton road
Oldbury, Warley
West Midlands
Tel: 021-544 6767

Stephens James Limited
47 Warrington Road
Leigh
Lancs WN7 3AE
Tel: 0942-676790

Tyrone Amateur Electronic
44 High Street
Omagh
Co. Tyrone
Northern Ireland
Tel: 0662-42043

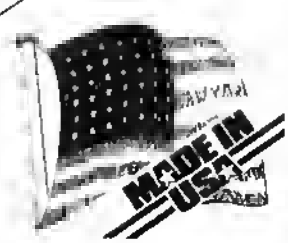
Uppington
12-14 Pennywell Road
Bristol BS5 0TJ
Tel: 0272-557732

UNABLE TO SUPPLY ANY OF THESE ITEMS

789 7171 CONTACT ALAN HISCOX

HRS Nationwide Dealer Network

'Hi-tech' Equipment for the Professional Amateur



SMC South Midlands Co

SCHDDL CLOSE, CHANDLERS FORD IND. EST., EASTLEIGH, HA

FREE FINANCE — BUY NOW SAVE MONEY — 0% INTEREST SUBJECT TO STATUS

PERFECT PORTABLES

What could Yaesu engineers do to improve on the hugely popular FTx90R series? The answer was easy, they designed and built the FTx90R2 series. The FT×90R2 series of transceivers provide high performance and a 2·5W output, when used with 'C' cells or nicads, ideal for serious portable operators, or when combined with matching linears, an easy to use compact multimode mobile or base station.

What more could you ask from a transceiver?

FT290R2 RRP **£429.00** Inc

FT690R2 RRP **£429.00** inc

FT790R2 RRP **£499.00** Inc

ALL THE ABOVE ARE SUPPLIED WITH FBA8, MH10E8, STRAP AND ANTENNA AS STANDARD.

OPTIONS INCLUDE

★ FL2025 2m 25W LINEAR	£115.00
★ FL6020 6m 10W LINEAR	£109.00
★ FL7025 70cm 25W LINEAR	£139.00
★ FBA8 EMPTY CELL CASE	£27.00
★ MMB31 MOBILE BRACKET	£17.50
★ CSC19 VINYL CASE	£8.50
★ NC26C NICAD CHARGER	£11.50
★ FTS7 CTCSS UNIT	£40.00

LIGHT IN THE HAND AND ON THE WALLET

OPTIONS AVAILABLE

NICAD PACKS

FBA10	7.2/9V colt case only (6xAA)	£11.50
FNB10	7·2 600mAH Nicad pack	£34.50
FNB12	12.0V 500mAH Nicad pack	£57.50

CHARGERS

NC18C	Charger mains (FNB12)	£17.71
SMC18	Charger mains (FNB12) 13A style	£13.80
NC28C	Charger mains (FNB10/17)	£17.71
SMC28	Charger mains (FNB10) 13A style	£13.80
NC29	Desktop quick charger 5hr (FNB9/10/11/12)	£69.00

SPEAKERS MIC

MH12A2B	Speaker/mic	£31.05
MH18A2B	Speaker/mic Miniature type	£31.05

CASES

CSC23	Soft Carrying Case (FBA10/FNB10) FT23/73	£10.58
CSC28	Soft Carrying Case (FNB12) FT23/73	£10.58
CSC36	Soft Carrying Case (FBA10/FNB10) FT411/811	£10.00
CSC37	Soft Carrying Case (FNB12/14) FT411/811	£10.00

OTHERS

YH2	Headset PTT via VOX (except FT23/73R & FT470)	£28.75
PA6	Mobile DC Adaptor/Charger (FNB9/10)	£24.15
DCTPA6	DC lead for PA6 c/w cigar lighter plug	£4.03
CLIP1	Belt Clip	£4.00

LEEDS
SMC (Northern)
Nowell Lane
Industrial Estate
Leeds LS9 8JE
Leeds (0532) 350606
9-5.30 Mon-Sat
Closed Sat afternoon

CHESTERFIELD
SMC (Midlands)
102 High Street
New Whittington
Chesterfield
Chest. (0246) 453340
9.30-5.30 Tues-Sat

JERSEY
SMC (Jersey)
1 Belmont Gardens
St. Helier, Jersey
Jersey (0534) 77067
9-5 pm Mon-Sat
Closed Wed

BIRMINGHAM
SMC (Birmingham)
504 Alum Rock Road
Alum Rock
Birmingham B8 3HX
(021-327) 1497/6313
9.00-5.00 Tues-Fri
9.00-4.00 Sat

AXMINSTER
Reg Ward & Co Ltd
1 Western Parade
West Street
Axminster
Devon EX13 5NY
Axminster (0297) 34918
9-5.20 Tues-Sat

SOUTHAMPTON SHOWROOM open 9.00-5.00 Monday to Friday, 9.00-1.00 Saturday. Service Dept open Mon-Fri 9.00-5.00.

SOUTH WALES AGENT: John Doyle, Transworld Comms, Neath (0639) 632374 Day (0639) 642942 Eve. Closed Thursday.

SMC South Midlands Communications Ltd.

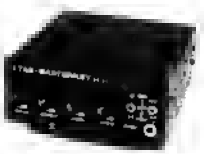
ROTATORS

Superb engineering standards combined with pin sharp setting accuracy means new technology from Yaesu create Kenpro Hygain.

ROTATORS		
AR200XL	OFFSET TYPE 3 WIRE	£49.50
G-250	BELL TYPE TWIST/SWITCH CONTROL	£78.00
G-400	BELL TYPE METER CONTROLLER	£139.00
G-400RC	BELL TYPE ROUND CONTROLLER	£169.00
G-600RC	BELL TYPE ROUND CONTROLLER	£219.00
HAMIV	BELL TYPE METER CONTROLLER	£327.00
T2X	BELL TYPE METER CONTROLLER	£499.00
G-800SDX	BELL TYPE 450 DEG VAR. SPD	£325.00
G-1000SDX	BELL TYPE 450 DEG VAR. SPEED	£368.00
G-2000RC	BELL TYPE ROUND CONTROLLER	£445.00
KR500	ELEVATION METER CONTROLLER	£149.95
G-5400B	AZIMUTH/ELE DUAL CONTROL	£375.00
G-5600B	AZIMUTH/ELE DUAL CONTROL	£435.00
RC5-1	BELL TYPE ROUND CONTROLLER	£219.00
RCSA-3	BELL TYPE VAR. SPEED AND PRESET	£425.00
RCSB-3	BELL TYPE VAR. SPEED AND PRESET	£675.00
ROTATOR HARDWARE		
AR200AB	ALIGNMENT BEARING AR200XL	£17.50
KS505	ROTARY BEARING 1½" MAST	£19.95
GS-065	ROTARY BEARING 2" MAST	£29.95
GC-039	LOWER MAST CLAMP G-400, 600 etc	£16.95
9523	CHANNEL MASTER BEARING	£19.95
CK46	ROTARY BEARING 1.5–2.5 MAST	£34.95
MC1	LOWER MAST CLAMP RC5 SERIES	£25.00
ROTATOR CONTROL CABLE		
RC5W	5 WAY G-400RC, 800, 1000SDX PER MTR	£0.48
RC6W	6 WAY G-250, 400, 600, RC KR500 PER MTR	£0.66
RC8W	8 WAY HAMIV, T2X 2000RC RC SERIES PER MTR	£0.72

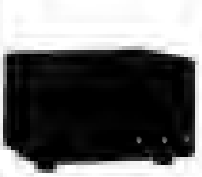
CARRIAGE:
ROTATORS FREE, ROTATOR HARDWARE £2.85, ROTATOR CABLE [illegible]

MORSE KEYS



MORSE KEYS			p.p.
HK702	STRAIGHT KEY	£42.95	£3.00
HK703	STRAIGHT KEY	£38.45	£3.00
HK704	STRAIGHT KEY	£26.35	£3.00
HK705	STRAIGHT KEY	£22.49	£3.00
HK706	STRAIGHT KEY	£21.80	£3.00
HK707	STRAIGHT KEY	£20.15	£3.00
HK708	STRAIGHT KEY	£21.50	£3.00
HK710	STRAIGHT KEY	£39.95	£3.00
HK711	STRAIGHT KEY KNEE MOUNTING	£41.75	£3.00
BK100	MECHANICAL BUG	£34.95	£3.00
MK701	SINGLE LEVER PADDLE	£38.35	£3.00
MK702	SINGLE LEVER PADDLE	£36.25	£3.00
MK703	SQUEEZE KEY	£34.50	£3.00
MK704	SQUEEZE KEY	£20.00	£3.00
MK705	SQUEEZE KEY	£32.78	£3.00
MK706	SQUEEZE KEY	£30.48	£3.00
HK802	DELUXE BRASS KEY	£112.54	£3.50
HK803	DELUXE BRASS KEY	£107.75	£3.50
HK804	DELUXE BRASS KEY	£99.69	£3.50
MORSE EQUIPMENT			
KP100	SQUEEZE KEYER	£109.75	£3.50
DEWSKEYSTD	STAR MASTER KEYER	£54.69	£3.50
DEWSKEY M	STAR MASTERKEY MEMORY	£94.99	£3.50
070	MORSE TUTOR	£56.35	FOC
DATA TERMINAL			
PK232/FAX/ NAVTEX	MULTIMODE DATA TERMINAL	£289.95	FOC

SWR/PWR METERS



FS710V

YS60

FS710V	50-150MHz	15/150W	PEP £107.80
FS300H	1.8-60MHz	20/200/1000W	£53.40
FS210	1.8-150MHz	20/200W	Auto SWR £65.50
FS301M	2-30MHz	20/200W	£42.25
FS301MH	2-30MHz	200/2000W	£42.25
FS711H	2-30MHz	20/200W	Head/Display £43.65
FS711V	50-150MHz	20/200W	Head/Display £43.65
FS711U	430-440MHz	5/20W	Head/Display £43.65
FS711C	26-30MHz	10/100W	Head/Display £24.55
FS500V	50-150MHz	20/200W	£81.95
W720S	130-440MHz	20/200W	Head/Display £52.75
SWR50B	3-5-150MHz		£36.75
FS80DL	3-150MHz	1/10W	£43.65
FS200	3-150MHz	5/20W	£43.65
SWR3E	3-5-150MHz	20/200/1000W	£28.75
JD110	1.5-150MHz	10/100W	£16.50
T435	144/430MHz	20/200W	£65.00
YMIX	3-5-150MHz	Rel. Power/SWR Twin meter	£31.50
OSCAR-171B	3-5-150MHz	Rel. Power/SWR Twin meter	£26.85
SP425	140-524MHz	5/15/150W	£119.95
YS60	1.6-60MHz	20/200/2000W	£93.15
YS500	140-525MHz	4/20/200W	£81.65

Carriage on all power meters £4.00

COMET & HOKUSHIN ANTENNAS

New from Hokushin, an exciting range of high performance antennas, the WX1 has been a best seller for some time now, available are its bigger brothers the WX2 ad WX4. Both are multi section 2m/70cm colinears and the mechanical construction the best we have seen yet. On the mobile front a new mini dual band mobile, the HS-727SS, very similar to the Comet CHL21J, and tests with our network analyser confirm its compatibility with our existing range of gutter and mag mounts. Also available a low profile hatchback mount and cable, the SS-B1, two new dual band antennas, the very slim VM-720SKR and the compact HS-727VMS. Both are suitable replacements for the 70N2M. For the HF enthusiasts a compact 10m HB9CV dual driven element antenna that is extremely light and very cleverly constructed.

WX2	WX4	HS-727SS	28HS-2HB
VHF/UHF Base	VHF/UHF Base	VHF/UHF Mobile	10m 2 ele HB9CV
144/432MHz	144/432MHz	144/432 mini	Dual driven element
6/8db gain	7.8/10.8db gain	114 5/8 wave	6dbi gain
200W max	200W max	100W max	500W PEP max
£75.00	£99.00	£16.95	£65.00

MOBILE ANTENNAS		
2QW	2m 1/2 wave	£4.95
2NE	2m5/ wave folding	£13.25
78B	2m 7/8 wave	£15.00
78F	2m 7/8 wave folding	£21.50
88F	2m 8/8 wave	£24.10
2S8	70cm 2 x 5/8	£29.37
3S8	70cm 3 x 5/8	£33.73
2S8E	70cm 2 section colinear	£32.80

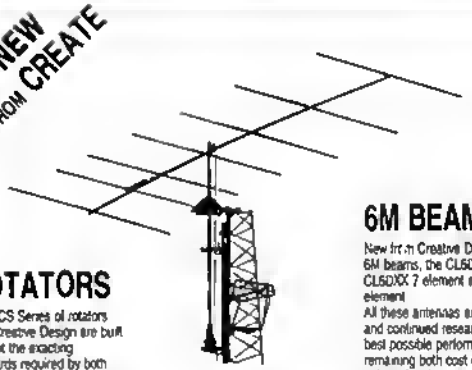
DUAL BAND MOBILE		
CHL21J	Mini dual band mobile	£14.95
CHL23J	Small dual band mobile	£16.90
CA2X4KG	2m 2 x 5/8 70cm 4 x 5/8	£39.95
70N2DX	2m 6/8 70cm 3 x 5/8	£37.75
HS-727SS	Dual band mini antenna NEW	£16.95
HS-727VMS	2m 1/2 70cm 2 x 5/8 NEW	£25.95
VM-7026SKR	2m 1/2 70cm 2 x 5/8 NEW	£24.95

DUAL BAND BASE ANTENNAS		
WX1	2m/70cm colinear	£54.99
WX2	2m/70cm colinear	£75.00
WX4	2m/70cm colinear, high gain	£99.00
CA2X4WX	2m/70cm colinear	£79.00
CA2X4MAX	2m/70cm colinear, high gain	£99.95
CF416MN	Duplexer 1.3-500/400-540MHz	£25.50
HS7900N	Duplexer Mess 1.6-150/410-460MHz	£25.50

ANTENNA MOUNTS		
GCCA	Gutter mount and cable	£14.25
HDTMCA	S/S trunk mount and cable	£19.50
SOMM	Mag mount and cable	£12.75
TBR	S/S hatch back mount NEW	£11.25
RS17	Mini hatch back mount NEW	£12.50
RS16	Mini gutter mount NEW	£12.50
SS-B1	Mini back mount & cable NEW	£26.50
CK-3LX	Cable assembly for RS16, 17, TBR	£19.95

CARRIAGE BASE ANTENNA £7.50, MOBILE ANTENNAS £4.00, CABLES AND MOUNTS £3.50

NEW FROM CREATE



6M BEAMS

New from Creative Designs are a range of 6M beams, the CL5DX 5 element, CL6DXX 7 element and CL6DXZ 8 element.
All these antennas are the result of long and continued research to achieve the best possible performance whilst remaining both cost effective and extremely robust.

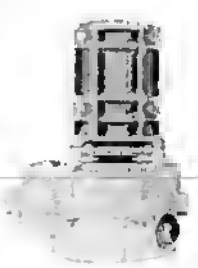
CL6DX 5 ele 13dB*	£115.00
CL6DXX 7 ele 14.3dB*	£168.99
CL6DXZ 8 ele 14.5dB*	£225.00

* Manufacturers figures

ROTATORS

The RCS Series of rotators from Creative Design are built to meet the exacting standards required by both professional and amateur users. A range of methods is available designed to cater for medium to large shed antennas. All the rotators are manufactured with high quality components allowing continued and reliable operation.

RCS-1	£219.00
RCSA-3	£425.00
RCSB-3	£675.00
CK-46 Rotary bearing	[illegible]



SOUTHAMPTON (0703) 255111
CHESTERFIELD (0246) 453340
AXMINSTER (0297) 34918

LEEDS (0532) 350606
BIRMINGHAM 021 327 1497

For full addresses see previous page.

SPECTRUM ANALYSIS

HF

JOHN ALLAWAY G3FKM
10 Knightlow Road, Birmingham
B17 8QB

DX NEWS

DX-NL says that YB0TK is a pilot who flies to **Angola** each month and that he has a permit to operate as YB0TK/D2. He may be on the air monthly until July. A news release from ARRL dated 22 February confirmed that **Walvis Bay** is now a separate DXCC country under point 3 of the criteria. Credit will be given for contacts made since 1 September 1977 - the date when the administration of the area was transferred from South West Africa to the Cape Province of the Republic of S.Africa. Cards may be submitted for credit after 1 June 1990. The same source says that PA3FAC is stationed with the UN Peace Force in the Sinai desert and will be there until 14 September. He is trying to get permission to operate as PA3FAC/SU. TL8WD, in the **Central African Republic**, is to be found near 21.230MHz most days at 2030, and he will make skeds for other bands. 9L1US in **Sierra Leone** is now very active on 21.3MHz from 2200 and will be on all bands soon if not already.

DX News Sheet gives some information on activity from **Antarctica**. Y90ANT should by now be on the air from Georg Forster Base and be there for a year. The operator is Y21RQ and likely frequencies of operation - (cw) 3kHz up from lower edge of band on lf and 10kHz on ht, (ssb) 3.790, 7.045, 14.190, 14.290, 21.190, 21.290, and 28.490MHz. HB9BPU is at the Greenpeace station until next January as ZL0AIC.

Sheridon Street, A92BE, says that he should soon be on 18 and 24MHz using a two-band home-made quad. All back QSLs have now been cleared and some 3,000 have been posted - each bearing definitive stamps from a special series depicting birds. IRCs are not accepted in Bahrain so Sheridon has arranged for G0LJH to sell them for him at 40p each with discount for more than 100.

According to the *Long Island DX Bulletin* HS0B and HS0E take turns as SEANET Net controller on Wednesdays on 14.320MHz at 1200. On Mondays HS0B joins another net on 14.226MHz from 1200 to 1500.

If you are looking for a contact with **Zambia** try looking for 9J2AL near 28.530MHz from 1600.

LA7DFA is due to be on **Jan Mayen Is** until the end of July. He will mostly operate near the low end of the cw bands. DF1SD, DF7TU, DJ0YI, and HB9BUN, will be on from 4U1ITU in Geneva from 25 to 29 May using the callsign 4U51TU. They will be mostly on cw and will also use the WARC bands. If you hear SI8MI which will be on the air between 28 May and 3 June this is a group consisting of SM0BRQ, SM0MPV, SM0HBV, SM5XD, and QH2BDQ on Market Reef - but on the Swedish side so therefore not eligible for DXCC credit.

Soviet amateurs were allowed use of the 18 and 24MHz bands w.e.f. 1 January this year. Holders of first-category licences may use cw, rtty, and ssb, but second-category licensees are restricted to using cw.

DXPEDITIONS

In a news release dated 2 March Jim Smith, VK9NS, said that he had just received telephone confirmation of his permission to visit the **Kingdom of Bhutan** to operate amateur radio. Telex confirmation was to follow. This comes after more than three years of negotiations with the Bhutan authorities. He says that his visa will be clearly marked to show that his visit is for amateur radio purposes and he will be met at Paro airport by the Director and Deputy Director of Wireless. Jim does not know his callsign but has asked for A51JS, and there are no time limitations on his visit. HIDXA needs contributions as a compulsory US $200 per day has to be spent during Jim's stay. Donations should go to HIDXA, P.O.Box 90, Norfolk Is, Australia 2899. The actual date of the visit was not known and it is just possible that it will already be under way or even over. In the latter case I hope you had a QSO !

He is also corresponding with the authorities in **Bangladesh** and has asked the Prime Minister for written "approval in principle" for a visit for amateur radio purposes. If successful Jim has suggested that the callsign S21JS might be suitable and that he would like to stay for two to four weeks. The outcome of all this is awaited with interest. There is in fact a national amateur radio society in Bangladesh (the Bangladesh Amateur Radio League) which is very much frustrated due to the lack of licensing in the country.

Jarvis Is was due to receive a visit by AH3C, K3NA, QH2BH, N7NG, WA6AUE, JG2BRI, and KN3T between 14 and 23 April. Unfortunately this news arrived too late for the April column. It is believed that Jarvis will be given DXCC country status because it is separated from other parts of the U.S territories in that part of the Pacific by "intervening sovereign territory". The closest US land is Palmyra Is but a straight line from Palmyra to Jarvis crosses the territory of Kiribati. Rules 2b and 3b of DXCC would seem to apply and recent similar cases - Market Reef and Kure Is - have been accepted. Contributions from Europe should go to Jarmo Jaakola, QH2BN, Kiilletie 5-C-30, 00710 Helsinki, Finland.

DX News Sheet lists the itinerary of AA6LF and family through the Pacific. They should be in the **Tuomoto Is** (FQ) now and in the **Society Is** (FQ) in June/early July. In late July they go to **Penrhyn Is** in the N.Cook Group as ZK1XP, then to **Christmas Is** as T32BQ, **Palmyra Is** as AA6LF/KH5, and **Kingman** Reef as AA6LF/KH5K. They should reach Hawaii by September. It is believed that they will however spend a lot of time taking part in nets.

PITCAIRN IS

Dave Miller, NZ9E, has sent me some information about Jim Russell, G3QKQ, who is currently operating as VR6JR. Jim is no stranger to the island and was last there helping the *HMS Bounty* descendants with their jetty rebuilding in 1985. He has kept in touch by radio since then and helped expedite goods to the island and provide a home for Pitcairn residents visiting the UK. He is staying with Ben and Irma Christian (VR6TD) whose son stayed with him last year. Since arriving in mid-January VR6JR had made over 6,000 QSOs and was expecting to double the number before leaving in May or June. He made a special point of being there for the Bicentennial on 23 January and has been using the special callsign VR200PI/JR, mostly on 14, 21, and 28MHz but he is also spending a lot of time on 50MHz hoping for F2 propagation into the US and Europe. Look for him around 50.110MHz !

FIRST CONTACT BETWEEN BV AND BY

9V1RH has kindly sent me an item translated from a bulletin produced by the Fuzhou section of CRSA by Mr Edward Teo in Singapore. It was written by BY4RC and goes as follows :"On the 12th December 1989 Mr Yang Leong Yong, BV2LB, had a QSO with Mr Chan Foong at BY4RSA for the first time. Mr Yang, an influential man in amateur radio affairs, helped to introduce ham radio activities into Taiwan. He told Mr Chan that in 1985 twenty five students passed the amateur radio examination and since then fourteen stations have been set up within Taiwan. In April 1989 a further seventy nine students passed, out of a total of 183 who took the second examination. Mr Chan at BY4RSA had also helped to introduce amateur radio activities into China. BV2LB had put a lot of

DX-HAPPENING

At the U.B.A.'s Annual General Meeting
Saturday, May 26th, 1990
Exhibition Grounds Kortrijk

Programme

14.30 - 15.00	Presentation of trophies: The European Community Trophies The First European Community Awards
15.00 - 16.00	**DX Slide Show** **The Bouvet DX-Pedition** **from Einar Enderud LA1EE/3Y5X**
16.15	Results of DX Quiz
16.30 - 17.30	Peter 1st Island 1987

Accommodation is available at the nearby Condor Hotel, tel: 32 56 20 06 67. Please make your booking as soon as possible. To spend the rest of the week-end leisurely we advise you to make a journey to our lovely sandy beaches. A visit to the marvellous City of Bruges is also highly recommended.

This event is organized by the UBA HF Committee.

OTH CORNER

FO0XXL	YASME Foundation, PO Box 2025, Castro Valley, Cal, 94546, USA.
HK0/N3JT	via W2GHK, 2417 Newton St, Vienna, VA 22180, USA.
S01EA	EA2JG, Las Vegas 69, 01479 Luyando, Alava, Spain.
TG0AA	CRAG, Apartado Postal 115, Guatemala City, Guatemala.
RH1W/UA4HVV	
RH1Y/UA4HVV	
UH1W/UZ4HWS	
UH1Y/UZ4HWS	alt to Box 73, Zhiguljovsk 446350, USSR.
VK200PI/JR	Gary O'Toole, KB6ISL, 9605 San Gabriel Ave, South Gate, Cal. 90280, USA.
VR6JR	Jim Russell, 136 Oyster Lane, Byfleet, Surray, KT14 7JQ.
XZ8CW/DX	via HA5PP, Baros u 38, H-1203 Budapest, Hungary.
ZK1XL	DL3MDJ, R. Rinder, am Hoelle 26, D-8912 Kautering, F.R. Germany.
Y90ANT	M. Gronak, Koellnische Str 22, Berlin 1190, DDR.
ZS9A	P.O. Box 2327, Walvis Bay, 9190, via S. Africa.
ZS9/DK7PE	Rudolf Klos, Klaine Unterg 25, D-6501 Niedar Olm, F.R. Germany.

effort into convincing the Taiwanese authorities to allow amateur radio communications between China and Taiwan and he hopes this will become an easy reality in March/April of 1990."

AWARDS

ZMT* and *P-ZMT Awards

CRCC has announced that these two certificates were discontinued w.e.f. 1 January 1990. They also sent details of the awards currently available from Czechoslovakia. These include:

S6S

For confirmed contact with at least one station in each continent - cw, ssb, rtty, or sstv only (no mixed). Endorsements for single-band plus single type of emission.

P75P

QSOs with at least one fixed station located in 50 ITU zones since 1 January 1960. Endorsements for 60 and 70 ITU zones.

100OK

QSOs with at least 100 different OK stations since 1 January 1954. Endorsements for each additional 100 up to 500.

OK SSB

Two way OSOs with Czechoslovak stations to a value of 25 "points"

1990 28MHz COUNTRIES TABLE

G4MUW	141 (ssb)	G4NXG/M	57
G4VVP	141 (ssb)	G2AKK	55 (cw)
GM4OBK	82	G4DXW	44
G0CKP	79	G0MXU	21
G4ZYO	67	G0JSM	15
GM4ZIL	63		

One point for OSOs on 14, 21, and 28MHz, and two on 1.8, 3.5, and 7MHz.

All CRCC awards may be claimed when sending in logs of the OK DX Contest - in this case no QSLs are needed but a log should of course be sent.

These are also available to listeners. Send list of QSLs, certified by a society awards manager, to CRCC Awards Manager, P.O.Box 69, 113 27 Praha 1, Czechoslovakia. Certificates are free to those whose own society applies the same rules, otherwise 10 IRCs for P-75-P, or 5 IRCs for the others. Endorsements cost 2 IRCs. Note that certified lists for P-75-P should show the location of the listed stations.

CONTESTS

SEANET WW DX Contest 1990

0001 21 July to 2359 22 July (cw)
0001 18 August to 2359 19 August (phone)

Single-operator, single and multi-band and multi-band multi operator sections. 1.8 to 28MHz (no WARC bands). Exchange RS/T plus serial number starting from 001. QSOs with stations in the SEANET area (DU/DV/DX, HS, YB/YC/YE, 9M2, 9M6, 9M8, 9V, and V85) 20 points on 1.8, 10 on 3.5, and 4 on 14, 21, and 28MHz. Contacts with stations in other SEANET areas have half these values. Multipliers are three for each SEANET country worked (besides those mentioned above these include A4, A5, A6.A7, A9, BV, BY, EP, HL, JA, JD1, JY, KH2, P29, S79, VK1-VK9, VO9, VS6, VU. XU, XV, XW, XX9, ZK, ZL1-ZL4, ZL6, ZL9, 3B8, 3B9, 4S7, 4X, 8Q, 9K, and 9N). No cross-band or cross-mode contacts allowed. One QSO per band - and numbers should begin from 001 on each band. Send log plus usual declaration to reach Contest Manager, Yathe 9V1JY, P.O.Box 2728, Singapore 9047, no later than 31 October 1990. Results will be sent to you if you include three IRCs with the entry.

In the **1989 ARI International Contest** GM4ELV scored 2,832 and G0ANH 256 in the phone section. On cw G3ESF came world sixth with 87,248 points.

PROPAGATION

Smithy's report is rather shorter this month and goes as follows ;" There was a distinct improvement in band conditions in the first half of March, including the weekends of the Commonwealth and ARRL Phone contests, due mainly to a less disturbed geomagnetic field. The sun continued to be markedly one-sided leading to a very strong 27-day component in the solar indices. Smoothing this out, however, reveals a slow increase in average values from a low of 175 sfu at the end of February to 188 by March 22nd, at which time the daily values were rising steeply and nearing the 250 sfu mark.

A monthly average flux of around 190 slu seems a possibility for March and past patterns suggest that April may see us back in the 200s - but readers can hardly see this as a prediction since the facts will be known by the time it appears in print ! On the wider question of when is, was or will be the peak there is as yet nothing to be added to the discussion in last month's report."

BAND REPORTS

This month saw reports from FE1JUD, G2AKK, G3s AGZ, GPE,

HF F-LAYER PROPAGATION PREDICTIONS FOR MAY 1990

The time is represented vertically at two-hour intervals 00(00)GMT for each band, ie 00=0000, 02=0200, 04=0400 etc.
The probability of signals being heard is given on a 0 (indicated by a dot) to a 9 scale; the higher the number the greater the probability with 1 meaning 10 to 19 per cent of days, and so on. Additionally 50MHz F-layer and 1.8MHz openings are indicated by a plus (+) sign in the 28 and 3.5MHz columns.

Time / GMT	28MHz 0000011111122 02468024680 2	24MHz 0000011111122 02468024680 2	21MHz 0000011111122 02468024680 2	18MHz 0000011111122 02468024680 2	14MHz 0000011111122 02468024680 2	10MHz 0000011111122 02468024680 2	7MHz 0000011111122 02468024680 2	3.5MHz 0000011111122 02468024680 2
** EUROPE								
MOSCOW	.....11111..	...12222332.	1.1455556652	324666677875	766655556799	875322223578	642.....1257	32.....24
MALTA	....111112..	...222333421	2125556667 53	5347777778887	988766667899	997533334689	885211.11368	+52.....35
GIBRALTAR	.....	....1111121.	1..133344531	311455666764	866776666898	998654344689	886321111368	++3.....4+
ICELAND	.....	.....	.....121.	12223442	422355555776	876544344567	675321111245	342.....2
** ASIA								
OSAKA	....11111...	...12222211.	...132224341	31114563	....1...1572	.....24.	.....2.	.....
HONGKONG	...12222221.	..1233334431	1..133235763	2...11.14785	1.....1686	364	31	.....
BANGKOK	..123333432.	..1334445641	2111232368 74	41...1.14887	5.....1688	2.....367	34	.....
SINGAPORE	..123444442.	1.2345456642	3111332368 75	51..11.14887	5.....1688	2.....367	34	2
NEW DELHI	..133444432.	1123334456642	3221132368 75	63...1.14888	72.....1689	5.....367	2.....35	2
TENERAH	..2444555531	2144445567 53	5453213368 87	7651..114898	972.....1689	74.....368	51.....136	2.....3
COLOMBO	..2445555531	2134455567 53	5322133368 87	74...1114898	83.....1689	6.....368	3.....136	3
BAHRAIN	1124555567542	3245445677 65	6562212368 88	875....14899	972.....1689	84.....368	62.....136	3.....3
CYPRUS	1.2445555532	3246667777 64	6577666789 88	878655567899	997422235799	8741....2478	751.....256	42.....24
AQEM	3235566666 54	5455445678 77	8773112368 99	9861...14899	984.....1689	861.....368	63.....46	3.....3
** OCEANIA								
SUVA/S	.....	.....11...	...12111232.	..1221.1254.	..241...153.	...1.....2..	.....	.....
SUVA/L	53341.....75	54562.....86	2368 41...284	.1673....462	..35.....53.	...2.....21.	.....	.....
WELLINGTON/S	.....	....1111...1.	..122212..31	1124311111152	..441....1462	..11.....23.	.....1.	.....
WELLINGTON/L	5334.....25	65561.....47	667821....77	45773....286	12551....463	..22.....24.	.....1.	.....
SYDNEY/S	...12221....	..1343321..1	1126432232.3	1.2631.13425	...3.....1565	...1.....362	.....3.	.....
SYDNEY/L	31112.....13	43233.....26	534651....67	323741...187	..151.....385	...2.....252	.....3.	.....
PERTH	..245551....	21356552....	432453321....	631231111221.	51.....145.	3.....364	135	2
HONOLULU	.....	.....11...	....1111221.	..1121.123..	..331...11..	..22.....	.....	.....
** AFRICA								
SEYCHELLES	323555566455	5455455676 77	8763122368 99	986....14899	973.....1689	85.....368	62.....46	3.....3
MAURITIUS	4.3556777765	6156466678 87	9473132368 99	9771.1.14899	984.....1689	861.....368	63.....46	3.....3
NAIROBI	533656677766	7556455678 88	9885122368 99	9983...14899	996.....1689	873.....368	651.....46	32.....3
HARARE	632656777877	8647556679 88	9877323368 99	9985...14899	9972....1689	885.....368	762.....36	43.....3
CAPETOWN	1..566778876	3..766567988	71.853235899	93.731.13899	9815.....689	8842.....368	763.....46	43.....3
LAGOS	6424557788 76	8646655579 88	9978522258 99	99872...3899	9985.....589	8852.....368	663.....36	43.....3
ASCENSION Is	443155667763	6653765578 85	9986632248 98	998741..2799	99851.....589	8862.....268	763.....36	43.....3
DAKAR	5333556778 65	7656655568 87	9887632127 99	999741...699	99851.....389	8862.....68	763.....36	43.....3
LAS PALMAS	21.243555542	4224666777 64	7657877778 98	9888766668 99	9987543346 89	9974311.1378	7752.....157	542.....24
** S. AMERICA								
Sth SHETLAND	677861	1667984	1335897	2....1..3798	723.....588	8751.....257	663.....35	33.....2
FALKLAND Is	4....2677764	711..3567887	9531.3335899	976211..3789	99841....479	8862.....147	663.....25	33.....2
R DE JANEIRO	4321.5666764	6543255567 87	9875332236 99	998731...489	99851....179	8862.....47	663.....15	33.....2
BUENOS AIRES	4222.5566664	6545.5566786	9877132335 89	998721..1389	99851.....69	8862.....37	663.....5	33.....2
LIMA	21.I21344443	5222434544 55	8655532322 47	9876I.1...28	99851.....6	8862.....3	563.....	23.....
BOGOTA	2...13333343	4211344434 55	7544532212 37	9866421...17	89851.....5	7862.....2	563.....	23.....
** N. AMERICA								
BARBADOS	21..2334444 3	4222444446 65	8655542112 58	987642....48	99851.....16	8862.....4	663.....1	33.....
JAMAICA	1....2222232	31..2333234 4	6433332211 26	8755411...16	89751.....3	6862.....1	363.....	.3.....
BERMUDA	1....I122232	31..1323234 4	6422332211 47	8754311...37	89751.....5	6862.....2	463.....	.3.....
NEW YORK	111121	2....1112233	5311111212 35	763321.1...26	78751.....4	5852.....1	263.....	.3.....
MEXICO	111121	2....122222	4311211211 13	653331.1...1	58751.....	2752.....	.43.....	.....
MONTREAL	1111	1....111233	4211111212 35	753211.1..26	78641.....4	5752.....I	253.....	.2.....
DENVER	.....	1.....1	31.....1112	4421....1..1	3664.....	1552.....	.23.....	.....
LOS ANGELES	.....	111	21.....11111	23211....1...	15541.....	.352.....	.12.....	.....
VANCOUVER	.....	.....	1.....1	22111...1..1	14531.....	.252.....	..2.....	.....
FAIRBANKS	.....	.....	....1...11..	11112...121.	.1331....1..	..22.....	.....	.....

Tha provisional mean sunspot number for March 1990, issued by the Sunspot Index Data Centre, Brussels, was 140.8. The maximum daily sunspot number was 230 on 24 March and the minimum was 71 on 9 March. The predicted smoothed sunspot numbers for May, June, July were respectively: (classical method) 140, 137 and 135; (SIDC adjusted values) 142, 137 and 131.

GVV, KSH. LPS, G4BLH, GW4KGR, G4s MUW, NXG/M, GM4OBK, G4VVP, G4WXT, and G0CKP. Many thanks to all - and apologies to those who included 10, 18, and 24MHz which have been left out to save space. Calls listed in italics were stations using cw.

3.5MHz
0100 J39CR, VP2EHF, ZC4ESB.
0600 *K6SS, N2KC/6, 6Y5FS.*
0700 *N7BSA* (Nev.)

7MHz
0000 A61AC, *VP2V/W2GUP, VP2EZD.*
0100 AP2ZE, UO70OJ, *VU2GAM.*
0200 *P40V,* S01EA, ZF2NO.
2000 *G4WYG/ST2.*
2100 9O5TE, *3W3RR.*
2300 *TL8CX, ZD7KM.*

14MHz
0100 SO1EA.
0300 VR6JR.
0600 FO0XXL, YK1AO.
0800 ZK1XL, ZL7TZ, *4K2OT (F.J. Land).*
1100 BY4RSA, HS0B, UA0/ GB4MSS.
1300 *DF5HA/H44.*
1600 V63AO, *ZL6A.*
1900 AL7KW, P29VMS, ZD7VJ, ZL, 3W8RR, *9V1YC.*
2000 BV7RA, EP2HZ, *PJ6/AA4OV, 9O5PL.*
2200 *KL7HF,* SO1EA, *4K2BDU (FJL).*
2300 *KC4AGY,* VU2GI,*9V1XW.*

21MHz
0600 FO0XXL.
1000 BY4BC, *KHO/JO1SEF,* P29VMS, 3A/OL2SQ.
1600 FR4FO, V51NAM, YB.
1800 KH8IJ, *S24U,* S83H, ST4/ WZ6C, 3W3RR.
1900 HS1BV, *KH6JF, LU1ZA.*
2000 *J20TW,* PJ4V, *ZM1AIZ.*
2100 S92LB.
2200 CE0ICO, J73WA.
2300 *JT1JTZ.*

28MHz
0800 KH8/SM7PKK, 8O7XE.
0900 BY8AC, JA, RA0A O/JT.
1000 AH9AC, BY5RF, VQ9LW, YJ8M, *XX9TDM,* 9M2YB.
1100 FT5XH, *KL7PJ,* S21U, S) 1EA, TZ6VV, *3W3RR.*
1200 A61AD, OK1CE/H44, *KHO/ JO1SEF,* 8O7CV.
1400 PYOFF, TL8HW, V47A, VP2VE, XE3XE.
1500 *KHOEHM, G4WYG/ST2. VP5VPX.*
1600 *D68CY, VY9CC,* XT2BW.
1700 W6-W7, ZS9A, 4K1J, 9L1US.
1800 *FO0MGZ, KH6IJ,* V31B, *ZL3GQ.*
1900 CE0MTY, JR4ISF/CE0, K6GSS/KH6, *V2/JJ1ZB*
2000 P40V, V31UK.
2100 XE3XE.

Many thanks to *DX News Sheet* (G4OYO), the *Ex-G Radio Club Magazine* (WA8TGA), *DX Report* (VK9NS), the *Lynx DX Group Bulletin* (EA2JGO), *DX'press* (PA3CXC), *DXNL* (OL3RK), and the *Long Island DX Bulletin* (W2IYX).

Closing date for July issue is 26 May.

UHF/VHF

NORMAN FITCH G3FPK
40 Eskdale Gardens, Purley, Surrey CR8 1EZ

Once again, there have been no major openings to enthuse about and the general impression is of rather mediocre VHF/UHF propagation so far this year. This past month, there have been short periods of enhanced tropospheric activity and a few auroras, but nothing even approaching the historic events of March, 1989. On 50MHz, Luxembourg stations are now active and the Italians have been granted a very small allocation.

PROPAGATION

At first glance, it might seem that the progress of sunspot cycles is of prime concern to HF operators. After all, during the troughs of cycles, we VHF/UHF enthusiasts still enjoy periods of excellent propagation, even though the 28MHz band may seem dead for weeks on end.

Ionospheric conditions are determined by solar activity, whereas tropospheric propagation is weather derived. On a world wide scale, we could have excellent HF propagation up to 50MHz co-existing with dreadful tropo conditions locally, due to deep low pressure systems.

High solar flux, with low geomagnetic activity, is the recipe for the best conditions for F-layer propagation. This combination has resulted in many memorable 50MHz openings to all continents during the past year. High geomagnetic activity has produced some superb auroral propagation on VHF, such as in the period 13-15 March 1989.

In a few years time, the only DX workable on 50MHz will be via the E-layer in summer, so we should be studying the trend of the solar indices to see where we are going. The propagation experts have suggested that the peak of Sunspot Cycle 22 could occur about now but prediction is difficult due to the erratic behaviour of the sun in recent months.

Every Sunday, the GB2RS news bulletin includes a solar factual data section. This gives the average sunspot number, solar flux and geomagnetic, A, value for the preceding week. I have plotted these for the first eleven weeks of 1989 and 1990 and the graphs clearly show this year's solar flux average to be 17.5% down on last year - 188.9 compared to 229.

This does not necessarily mean we have already passed the peak of Cycle 22, for the sun may burst into hyper-activity again by the time you read these comments. Meantime, keep an eye on the observations of Smithy, G8KG, which John Allaway, G3FKM, often includes in the HF section of *Spectrum Analysis.*

The A index comparison over the same period reveals 1990 to be 29.7% down on last year, but that is because of the exceptionally high value of 79 recorded in the 13-19 March period last year. Based on the first ten weeks, this year's average is 13.8 compared to 14.3 in 1989, only a marginal difference.

BEACON NOTES

The Malta beacon, 9H1SIX, has resumed service on 50.085MHz following replacement of the gale damaged antenna. Contrary to what was published last month, I now understand from 9H1BT via GW3LDH that it will not QSY to 50.515MHz. In Venezuela, YV5ZZ plans to operate a 50MHz beacon, callsign YV5ZZ/6, probably on 50.045MHz. PT7AAC is a new Brazilian beacon on 50.078MHz located at HI06RF; it runs 5W to a quarter-wave ground plane antenna.

SOFTWARE

Last month I mentioned Nigel Wilson's, G4VVZ (NOT), contest logging and scoring software which he developed for the *Derbyshire Hills Contest Group.* He has now sent a copy of the latest version, written for the Amstrad PCW8000 series computers. It comprises a suite of short programs which are selected by the 'Chain' command feature of Mallard Basic. Duplicate checking is carried out as the callsigns are entered, by creating and opening keyed data files using the 'Jetsam' facility.

Nigel has placed the system in the Public Domain on an 'E & O.E' basis, so I had a thorough look at all twelve programs. The only significant necessary changes were to bring the distance and points calculating routines into line with RSGB Contest Rule 9, and to write definitive locator validity checking routines. He has now compiled a User's Manual which explains the system and then takes you step by step through a typical logging and scoring exercise.

I have used the system to score a recent contest log and it proved easy and quick to use. Locators can be entered in both Maidenhead and E-OTHL form and there is a separate program for converting E-OTHL to Maidenhead. Another useful feature is the RECALC program which enables you to re-score an entry from another location.

The complete set of Basic programs, named OHCG, takes up 43k on a 173k single density 'A' drive disc. The manual is available in two versions; in plain ASCII form (34k) so that you can edit with your favourite word processor, or in LocoScript 2 (48k) formatted to print on 20 pages of A4 size paper. If anyone wants a copy, send me a formatted CF-2, A Drive 3 inch disk in a Jiffy Bag, with return postage and a self-addressed label.

METEOR SCATTER

May is a reasonable month for MS operators with several potentially useful streams. Last month I mentioned the Eta Aquarids whose parent body is comet Halley. On 8 May, there are the Halleyids stream, which has fairly similar parameters, and the Piscids, whose Right Ascension is 12 deg. and Declination, +19 deg. The Nu Piscids (RA 16 deg. Dec +27 deg.) peak on the 12th, followed by the Omicron Cetids (RA 22 deg, Dec -4 deg.) on the 14th. These last three are all daylight streams.

BAND PLANNING

The March VHF/UHF column included a proposal by the VHF Committee for a revised band plan for 70MHz. Several members sent comments on this and submitted their own proposals. The problem is that if you ask ten people to write a band plan, you'll get ten different ones. My own feeling about band plans in general is that we should avoid being too specific, such as writing in dedicated frequencies for FAX and ATV talk back, for example. Certain activities, such as packet radio, do need common frequencies, but others do not.

Amateur radio is an evolving hobby and the days when CW and AM were the only modes have gone forever. We have to make room for those who wish to experiment with, and use, newer modes. In formulating a revised band plan, we try to accommodate existing usage but sometimes this is inappropriate.

A case in point, which some will recall, was the first mass appearance of SSB on two metres. The original Belcom Liner-2 transceivers were crystalled up for the top part of the band and 145.41MHz was the main centre of activity. Then along came repeaters and a new band plan to accommodate them, so the SSB users had to move.

All your letters, suggestions and comments already received, or yet to come, will be considered by the VHF Committee during forthcoming meetings, along with the needs of special interest groups, such as Raynet and packet radio. We will try to achieve a 70MHz band plan which will satisfy the majority, but it must be appreciated that there will have to be some give and take.

During its March meeting, the VHF Committee discussed the 50MHz band plan which now has to accommodate the new CW and telephony Novice Licence allocation of 51.25 to 51.75MHz. Raynet, packet radio and repeater groups are all interested in staking claims for channels and some have already contacted the VHFC, but it is essential that the individual users' views are known.

Locator squares table participant and *RadCom* cartoonist Paul Thompson, G8MEN, at his home in Shrewsbury.

Please think about this band and let me have your comments about a possible repeater network, including the RX/TX split - why stick to 600kHz? - where packet radio channels should be, an all-mode section, an exclusive FM section, channel spacing - does it have to be 25 or 12.5kHz? - the beacon sub-band and anything else I haven't mentioned.

Unlike the parochial 70MHz band, 50MHz is an international allocation, so planning has to take this into account. To avoid any confusion, I asked the Chairman of the VHFC to send a short statement of the story so far, but unfortunately nothing was received up to my deadline. During our June meeting we will also have to consider relevant matters arising from the Torremolinos conference in April.

Meantime, it would be useful to know what equipment 50MHz operators are using to get on the band. Does the majority use dedicated, all mode transceivers, or linearly transvert from another band? If the latter, is the 'prime mover' a channelized FM or an all-mode model?

THE VHF CONVENTION

A reminder that the Society's National VHF Convention is on Saturday 12 May from 1030 - see page 23. The VHF Committee will have a stand, so we hope to discuss VHF/UHF matters with some of you. Two pairs of turnstiles will be used, so you can form two queues instead of one long snake back to the gates. The car parking will be professionally marshalled this year.

CW PRACTICE

Some years ago the Society negotiated with the DTI to allow B licensees to use morse on the VHFs. This was intended to give those wishing to take the morse test an opportunity for on air practice using conventional hand keys. Numerous informal groups take advantage of this and have regular nets on FM and SSB.

Many individuals have improved their send and receive capabilities enough to pass the test, which is commendable. However, it is becoming a bit too much of a 'good thing' in the London area where several nets operate in the main SSB part of the band, irrespective of conditions. May I suggest these nets move into the all-mode, non-channelized section, 144.500-144.845MHz? I realize that the band plan shows that 144.250MHz is used for RSGB slow morse transmissions, but this does not mean it has to be used for all morse practice.

In the evening of 12 March, I heard a G0L** and a G0M** practising on 144.150MHz, on FM, would you believe? They were using audio oscillators in front of their microphones, so several expletives were broadcast when one of them made numerous errors! It counted at least ten carriers either side of 144.150MHz. They were probably not interested in VHF at all, but merely used any convenient frequency on 144MHz in complete disregard of the band plan and with no consideration for other users. This we can do without.

NORTH POLE 90

Laurence Howell, GM4DMA, called in on our breaktast net on 14.132MHz on 25 March; he was operating UA0/GB4MSS from the Sredniy Island base camp. Other operators were Morag, GM0MUV; Sergei, EK0AAA; Nick EK0DJG and Galina, EK0DSP. Morag was due to leave for the Soviet Ice Station forward camp around 28-30 March and is the first woman to operate from any such 'ice mobile' location. Her call is UA0/GB4ICE.

As for conditions, Laurence said that they see auroras and receive Band 1 TV from northern Norway every night when geomagnetic conditions are stable. When the geomagnetic field is high, the aurora shifts southwards and all radio propagation suffers severe D-layer absorption.

The peak time for TV is around 1730, but it has come in as early as 1400 in disturbed conditions. In March, TV from Varanger was copied on 7, 9, 11-16, 18, 23 and 24. He suggests that the optimum time for 50MHz double-hop Arctic-E would be 1400-1800UTC. Up to 25 March, the only amateur signal identified on 50MHz was CW from OH9NLO during an aurora.

They are in contact with their press office in London twice each day and also send their own news bulletins through the packet network. By arrangement with the University of Surrey, they have direct access to the UOSAT-2 (UO-11) satellite, including the digitalker, so listen on 145.825MHz when this spacecraft is within UK range. Laurence has been active on the European VHF net on 14.345MHz from time to time.

The characteristics of VHF propagation from these high, Arctic latitudes is little known. We are familiar with auroral propagation from outside the auroral oval, but the communication possibilities within it remain to be researched in detail. This expedition, coming at the peak of a sunspot cycle, should provide some fascinating data.

50MHz

Ray Cracknell's, G2AHU (HWR), February report contains an interesting section on off-line propagation. He writes: "There were many queries about the off-line reception from 9L1US and the persistence of weak propagation after fade-down around noon. Sierra Leone is north of the equator, therefore signals are, by definition, not strictly 'transequatorial.' But Freetown sits right on the line of zero magnetic dip and is, therefore, ideally situated to encounter the more northerly of the over-dense regions of the tropical ionosphere.

"Prior to noon, the almost normal F-region gave us excellent optimum distance - approximately 5,000km - one-hop skip into Britain. Then, as the MUF rose, the skip shortened and the over-dense regions became field aligned providing a scattered signal and off-line propagation. Observations on the 9L1US beacon at G2AHU showed most off-line to be, as usual with TEP, mainly up to 20° west of the direct bearing, but on one occasion an easterly shift was observed."

There were sixteen days in February when Scottish-type auroras were reported from Britain. The band came to life on the 21st, with daily openings to West Africa, several minor, then a major opening to ZS6 on the 27th. On the 28th, the band opened to Western Australia with the following stations reported: From G, VK6s HB, HK, RO, WD, YU, ZFY and ZKO. From GI, VK6s HK, KXW, RO and ZKO. From GJ, VK6s HK, KXW, YU, ZFY and ZKO, with a weak VK8 heard. From GM, VK6s HK and KXW.

From Greece, Costas Fimerellis, SV1DH, reported poor days on the 2nd and 10th, with the 15th and 25th as the best. 16 countries were heard or worked in the month, mainly in Africa, but also FR, EA8, KP2, J3 and FY.

From Zimbabwe, Mal Gaddes, Z23JO, reported regular signals from the Mediterranean region. The most consistent beacon was 5B4CY, with SV1SIX quite reliable. On 27 February, he worked G, ZC4 and three W5s. Mal wonders why only the Gs and Ws seem to use CW?

Mike Barry, ZD8MB, was a regular reporter to G2AHU from Ascension Island but should be back in the UK about now, where his callsign is G4MAB. His ZD8HF beacon on 28.925MHz went QRT on 20 January, but ZD8VHF on 50.032MHz was still QRV. Hopefully it will continue to operate. Mike has provided a unique, long term opportunity to study propagation from the middle of the Atlantic Ocean during the current solar cycle.

Next some items from the *6m Information Pages* published by Ted Collins, G4UPS (DVN). All Luxembourg amateurs have been given use of the band 50.000 to 50.450MHz from 3 March, 100W ERP with horizontal antennas; some of them worked down to ZS3 on the first day. The Italian stations have been active since 19 March, but they only have a tiny band, 50.1515 to 50.1635MHz, and a 10W power limit. Even so, some of them completed TEP QSOs with ZS stations on the opening day.

From St Helena, ZD7CW has

ANNUAL VHF/UHF TABLE
January to December 1990

Callsign	50MHz Cty	50MHz Ctr	70MHz Cty	70MHz Ctr	144MHz Cty	144MHz Ctr	430MHz Cty	430MHz Ctr	1.3GHz Cty	1.3GHz Ctr	Total Points
G4XEN	—	—	—	—	51	10	32	3	1	2	99
G0CUZ	—	—	—	—	53	8	14	1	—	—	76
G1WYC	5	3	—	—	27	9	15	6	—	—	65
G3FPK	—	—	—	—	49	8	—	—	—	—	57
G8PYP	4	4	1	1	25	7	9	2	—	—	53
G7CLY	—	—	—	—	41	4	—	—	—	—	45
G4OUT	—	—	7	1	28	5	—	—	—	—	41
G6HKM	2	4	—	—	21	7	1	2	—	—	37
GM0GEI	18	15	—	—	—	—	—	—	—	—	33
GW6VZW	21	9	—	—	—	—	—	—	—	—	30

British counties are those listed in the January 1990 *RadCom*, but excluding IOS; 77 in all. Up to three different stations allowed in all 12 GM regions. Do not include EI counties. Countries are the usual DXCC ones plus IT9.

RSGB NATIONAL VHF CONVENTION

Sandown Park Racecourse, Esher, Surrey

SATURDAY 12 MAY 1990

- **One day exhibition and lecture programme**
- **Specialist groups**
- **Full lecture programme on VHF, UHF and micro-wave subjects**
- **Equipment test facility**
- **Morse tests**
- **Presentation of trophies**
- **Comprehensive trade exhibition**

PROGRAMME

1030	**Convention opens.** Enter through main entrance. **Refreshments.** Snack bar in the hall will be open from 1100 to 1800 and the licensed bar will be open throughout the convention.
1130	**AGM** 6m Group.
1330	**Convention address and presentation of trophies** by RSGB President Frank Hall GM8BZX

LECTURE PROGRAMME

Detailed Arrangement for Lectures will be Notified on Arrival

	A	B	C
1415	'The Optimum System for VHF/UHF Transverters or Black Boxes' *Angus McKenzie, G3OSS*	'New Amateur Satellites launched This Year' *Ron Broadbent, G3AAJ*	'Communication by Light' *Dr. Julian Gannaway, G3YGF*
1515	'DX and the Solar Cycle' *Ray Cracknell, G2AHU* *Prof. Martin Harrison, G3USF* *Ted Collins, G4UPS*	Microwave Committee Forum	Remote Imaging Group AGM *Henry Neale, G3REH*
1615	VHF Contests Committee Forum	'Construction of Simple Microwave Sources' *Sam Jewell, G4DDK*	Morse Test Forum *Robert McEwan Reid, G4GTO*
1715	Lecture Sessions Ends		
1800	Trade exhibition closes. Convention ends		

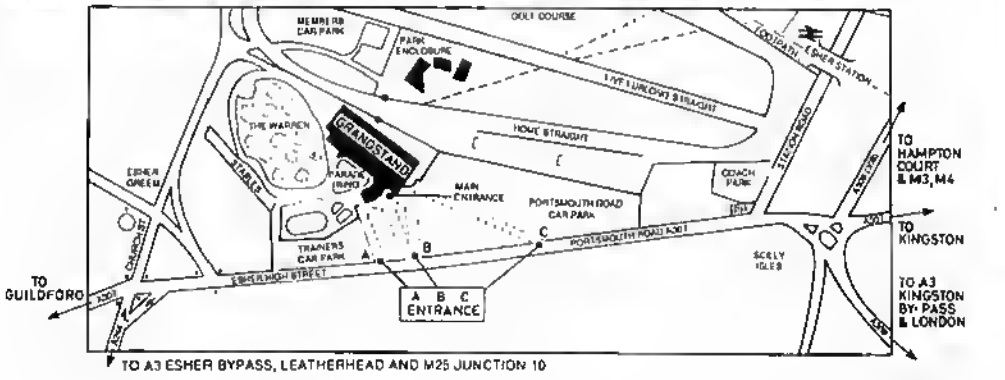
ADMISSION

To simplify management and to reduce costs, it has been decided, as last year, not to issue admission tickets for this convention, either in advance or at the gate.
Admission will be by payment on entry as follows:

Convention and exhibiton	£1.50
" " " (under 18)	£1.00
" " " (under 14)	Free

RAIL TRAVEL
British Rail
WATERLOO
TO ESHER

ACCESS MAP TO SANDOWN PARK
Talk-in station
GB2VHF:
channels S22
SU22



Map by courtesy of United Racecourses

been quite active recently but up to late March had not worked any Europeans. QSLs for Julian go via N4CID. The Southern Sudan expedition mentioned in the March VHF/UHF seems to have been put back and was due to start on 15 April, lasting about three weeks. 50MHz gear has been provided and the callsign is ST0/PA3DFT.

As every radio amateur knows, the very first thing any country does after gaining independence is to change its amateur radio callsigns. Namibia was no exception and the new prefixes are V50 for the ZR3s and V51 for the ZS3s. Beacon ZS3VHF is now V51VHF and ZS3E's keyer should be sending V51E.

Trevor Day's, G3ZYY (CNL), trip to Gibrattar has been confirmed, the dates being 21 June to 12 July using the callsign ZB2HN. Activity will be atl weekends and most evenings, with some daytime operation possible. ZB2EO, a very experienced operator, is currently ORV from The Rock and has been worked by ZS stations.

At tong last, Walvis Bay has been accorded DXCC status retrospective to 1 September 1977, but cards should not be submitted for DXCC credit until after 1 June. ZS9H is a regutar operator there, as mentioned last month. Following the death of DL3ZM, Gerry's logs for his DL3ZM/YV5 operation have been passed to K8EFS, so anyone requiring a QSL should contact Andy. Ho is also acting as QSL manager for YV5ZZ.

Darrell Moody's, G0HVO (GLR) report covers the period from 25 February when he worked 9L1US (IJ48) at 1137, just before the band closed. ZS stations were heard till 1715 on the 27th and the beacon, ZS3VHF, till 1810. On 3 March, the JAs that GJ4ICD was working were inaudible in Tuttley. On the 10th, he contacted ZS6WB (KG44) at 1202 for his first South African.

Darrell discovered an aurora just before midnight on the 12th and worked GI8YDZ (IO65), GM8MBP (IO87) and GM0GEI (IO77), the event ending at 0045. Weak auroral CW from GM4DGT was copied at 2240 on the 13th, but CQ calls proved fruitless. Similarly, on the 18th, GM0GEI was heard for a few minutes from 2120. In summary, he is rather disappointed with conditions which seem inferior to those of February/March last year.

Neil Carr, G0JHC (LNH), reports strong signals from 9L1US on 24 and 25 February. He worked ZS3KC on 4 March and the next day "...saw the best opening to ZS6 so far this cycle with signals S9 plus 30dB. In fact, ZS6WB was S5 with a screwdriver for the antenna." A 45 seconds opening on the 10th brought a contact with ZS4S (KG41) and on the 14th he worked Z23JO.

Neil says that it can be most frustrating for northern stations in the early part of the year, since many openings enjoyed by southern stations never reach his area. He cites 11 March when all ZS call areas were being worked from the south of England for several hours, yet not a whisper from any of them at his latitude.

Steve Smith, G1WYC (LCN), is a new contributor. He uses an FT-726R running 10W to a dipole antenna 12m AGL, his OTH being 1m below sea level. He is active on other bands and now has an entry in the Annual Table.

John Hunter, G3IMV (BKS), confirms the good opening to ZS on 11 March, the one that didn't reach Lancashire. He heard ZS2BE (KF26), ZS5DW and ZS5X (KG50), ZS3SW, and various ZS's. All those in squares he needed he couldn't work as he was unable to break through the Fs and southern G stations. However, he did contact ZS6AXT (KG33) and ZS9A.

G4UPS worked 9L1US on CW at 1150 on 24 February for his 75th country. On the 27th Ted worked ZS6LN (KG46) at 1508, then ZS6AXT, and ZR6R (KG44) at 1714. In the VK6 opening on the 28th, Ted contacted VK6RO (OF77), VK6YU and VK6HK (OF78) from 0924. VK6s ZKO and ZWX were also heard.

In March, Soviet TV was heard from 0840 on the 2nd and at 1301 OA8ABT was heard working Gs. Weak JAs were copied from 0914 on the 3rd and he worked JR2HCB on CW at 0950. The next day brought ZS3/G8WNP (JG87) at 1418. On the 10th, G stations were heard working Z23JO, FR5EL, A22BW and various ZS6s, none of whom were audible in Devon. Other ZS activity is reported on the 11th, 12th and 14th. Ted records nil activity on the 7th, 13th, 15-17th and 19th.

Ela Martyr, G6HKM (ESX), reports OSOs with ZS6AXT, ZS6WB and ZS6LN on 10 March. A CQ call next day brought a reply from ZS6AXT again. In the aurora on the 12th she contacted three OZs for a new country and a couple of new squares. The event also brought QSOs with GM8MBP and GM6VXB (IO97), another new square.

Steve Damon, G8PYP (DOR), lost his antennas three times in the severe gales of January and February. Each time he installed a stronger support system, but Mother Nature defeated his efforts. However, he is now QRV again and on 10 March worked ZS6LN and the next day, ZR6A. George Ripley, GD3AHV, records QSOs with 9L1US on 24 February, VK6HK on the 28th for his first Oceania QSO, and ZS3/G8WNP on 4 March.

Geoff Brown, GJ4tCD, worked three VK6s from 0932 on 28 February and heard others as previously mentioned. At 1020 he contacted ZC4MK on back scatter and at 1256 heard OA8ABT when beaming east; the correct heading brought the signal up to S9 plus 30dB. 3 March was a 'star day' with 63 JAs worked from 0920 till 1025 when he had to QRT to do some work. At 1510, LX1JX (JO30) was contacted on 28MHz and immediately afterwards on 50MHz for a claimed GJ/LX first. Other QSOs were with OE5KE and TU4DH (IJ85).

On the 4th, Geoff worked VK6YA (OG89) at 0940 for another new square, and weak JAs were heard. There were strong Arabic R/T voices on the morning of the 5th and on the 7th, from 1200, he completed OSOs with ZSs 6WB, 3E, and 5AV with others heard.

On the 11th, there was: "The biggest ZS opening ever" following the appearance of ZS6PW at 1000 and by 1040 the band was full of very strong ZSs from most areas. Over 45 southern Africans were worked or heard and the best OSOs were with ZS2BE and ZS2OD (KF26), ZS4RP (KG30); ZS5OB and ZS5X (KG50), ZS2NR (KF37), ZS6LUX (KG56), ZR1L (JF96), A22BW (KG38) and ZS6AXI (KG33). There were more ZS openings on the 12th, 1200-1300, while the 14th brought QSOs with TR8CA, Z23JO and ZS6XJ till QRT time at 1400.

LOCATOR SQUARES TABLE
Starting date: 1-1-1979

Callsign	50MHz	144MHz	430MHz	1.3GHz	Total
GJ4ICD	355	263	119	59	796
G4IJE	307	338	5	2	642
G8HCV	243	231	—	—	474
G0JHC	232	48	—	—	280
G3IMV	221	427	125	51	824
G6HKM	193	217	109	46	565
GM0GEI	177	—	—	—	177
G4TIF	172	204	111	—	487
G4VXE	147	162	42	4	355
G1SWH	143	149	53	—	345
G1KDF	139	180	102	37	458
G0DAZ	137	316	122	39	614
G8PYP	119	106	31	—	258
G1SMD	115	106	—	—	221
G8LHT	113	185	93	14	405
GJ6TMM	109	151	52	—	312
G4MUT	98	153	94	34	379
G0HVO	89	71	—	—	160
G0EVT	88	209	57	—	354
G0LFF	83	153	—	—	236
G4RGK	69	302	140	52	563
G6MEN	67	54	27	3	151
G4XEN	88	294	114	5	479
G1DOX	54	73	16	8	151
G1LSB	44	172	143	—	359
G8XTJ	44	120	—	—	164
G6DER	43	183	114	82	422
GM1BVT	41	21	—	—	62
G1CEI	11	77	18	—	106
GM1ZVJ	6	48	—	—	54
G4KUX	—	384	120	—	504
G0CUZ	—	330	73	—	403
G4RRA	—	280	80	—	360
G4SSO	—	256	98	—	354
G4PIO	—	261	87	—	348
G4SWX	—	347	—	—	347
GM4YXI	—	340	—	—	340
G4DHF	—	325	—	—	325
G8ATK	—	143	94	52	289
G0GMB	—	187	99	—	286
G1GEY	—	170	92	22	284
G6STI	—	152	69	24	245
G4YTL	—	245	—	—	245
G3FPK	—	241	—	—	241
GM4CXP	—	198	31	—	229
GW4FRX	—	228	—	—	228
G4DOL	—	216	—	—	216
G4XBF	—	171	—	—	171
G4TGK	—	137	—	—	137
GW4VVX	—	115	—	—	115
GM0GDL	—	83	22	—	105
G6UWO	—	41	44	18	103
G7CLY	—	100	2	—	102
G1WPF	—	101	—	—	101
G6ODT	—	21	47	—	68
G6HDZ	—	64	—	—	64

No satellite, repeater or packet radio OSOs. "Band of the month" 50 MHz.

70MHz

Apart from comments from readers about a revised band plan for 70MHz, not a single report of any activity has been received this month, even though there were Cumulative sessions on 25 February and 11 March. The final session and the Fixed contest took place on 25 March, after the deadline, so hopefully there may be some reports for the June column?

144MHz

G1WYC uses an FT-726R giving 10W, with a 10-element Jaybeam Yagi 12m AGL. Steve found things rather quiet but did make QSOs with DJ6LV (JO31) and F6CGJ (IN78) on 7 March, FC1MOZ (JN29) on the 16th and FC1EAN (JN06) on the 20th, the last being his best DX of the month at 674km.

G3IMV has pensioned off his well-used Nag 144 amplifier and now uses a Sagra 600. The original imports used a pair of 4X150 valves which is rather surprising, since for

yaars these have only been manufactured for replacement purposes. The UK distributor replaces them with 4CX250Bs, those in John's being of Chinese manufacture. One kept flashing over and blowing the only fuse - in the power transformer primary circuit - so he has replaced them with genuine Eimac ones and all seems to be working OK now.

With 427 squares worked, he has come to a grinding halt on the band but was hoping to contact GW0KZG/MM in some of the 'wet' squares via MS mode during his March and April voyages. He heard him calling CQ on 144.125MHz but wonders if Andy offset his BFD enough to detect anyone answering?

John Palfrey, G4XEN (NHM), operated in the Derby Club contest on 11 March, completing 104 contacts, and which boosted his table tally in an otherwise dull month. He reckons we must have at least one good aurora before summer before we "...settle down to some boring hours at the receiver waiting for Es DX to appear." The storms earlier this year damaged his KR400 rotator which seems to have lost its braking capacity. He hopes to repair or replace it when calmer weather allows.

G6HKM found conditions enhanced on 22 February, best DX being DK5DZ (JO42). Eta gave some points away in the contest on 3/4 March and worked her first GM of the year, GM4AFF (IO87). On 7 March, she had an incomplete QSO with EA1NV (IN73) at 1217, then had a proper one later at 1403. She operated in the Derby contest but remarked that activity gets less every year. Even so, she thoroughly enjoyed the event. The only auroral QSO the following day was with GM0HUO (FFE).

Darrell Mawhinney, GI4KSD (DWN) was very pleased to work W5UN off the Moon at 0000UTC on 3 March. He reckons this is only the second EME QSO from GI, the first having been made some seven years ago. He thinks an auroral QSO with LY2BJB on 13 November last year may have been a GI/LY2 first, too. He found conditions rather flat in the 3/4 March contest, the best DX being ON4ASL/A (JO10). Conditions seemed better on the 15th and he worked F6FLB in Calais, plus many G stations.

John Eden, GM0EXN (HLD), writing on 4 March, reported auroras from Dunnet Head every day from 25 February, but mostly very weak. He mentions that the *British Astronomical Society* is seeking information on radio auroras and that Leicester University has a large antenna array at Bower, a couple of miles from him. There is supposed to be a similar array somewhere in Sweden. If so, what information are they getting and where are any results being published? Can anyone enlighten us?

At G3FPK, March produced little in the way of real DX. Conditions in the contest on the 3rd/4th were decidedly flat whenever I listened and at the end, the leading UK stations were giving serial numbers in the 600s. Activity seemed low; perhaps people are getting fed up with contests? I 'looked in' on the Derby event on the 11th and gave a few points away, but again thought activity was poor.

I discovered an aurora just before midnight on the 20th and worked GM4IPK (SLD); Andy told me he found the event at 2324 and that GB3LER and SK4MPI were not operational. The only other DX heard in south London were SM5BSZ and SM5DCX. Signals were quite good but few people were about.

I found another event on the 25th which probably started around 1500. The only stations worked were SM5DCX (JO89) at 1550 and GM0CLN (LTH) at 1555. I listened for some time to GM4IPK and G4KUX conducting tests to see what reflections they were getting from different directions; as far 'west' as 290 degrees, in fact. I was able to copy Andy wherever he was beaming, but Nick's signal never went auroral. Once again, activity seemed very poor.

I alerted John Nelson, GW4FRX (PWS), to this event and he worked a few OHs but none in new squares. I doubt I could have copied them with all the digital hash from the north. GM0EXN and GW4FRX telephoned me on the 26th about another aurora, but this was much weaker. I heard GM4IPK calling CQ at S3 and at 1726 called GM0EXN on CW on 144.251MHz, who was only S2.

430MHz

G1WYC has a module for this band for his FT-726R again running 10W. Steve uses a 19-element Tonna Yagi on this band. He mentions a QSO with GI0GDP (IO74) on 16 March but otherwise found this band also very quiet.

G6HKM's antenna was stuck facing south for the 3/4 March contest, so that limited Eta's operation. However, she did work into SRY, IOW, PWS, DOR and BKS. The rotator was overhauled on the 16th and a CQ call was answered by G1GEY (TWR). The only other reader to mention this band was G8PYP who worked FTANH on 17 March.

DEADLINES

That wraps it up for another month. Perhaps we may have some early Es to gloat over next time? Meantime, let's have some more entries for the Annual Table. The deadline for July is 28 May and for August it is 23 June.

SWL

BOB TREACHER BRS 32525
93 Elibank Road, Eltham, London SE9 1QJ

Conditions during March had been quite reasonable, although some reports suggested that as we were about at the top of the sunspot cycle and at the spring equinox, things could have been better.

Some interesting DX had been reported, but there was little to make me sit up and take notice. Mention was made of S21U, a one-day expedition to Bangladesh, but those who heard the station commented on the very weak signal, probably because of the low power or poor antenna being used.

14MHz had probably provided the best conditions, with the band staying open quite late on some days. Many Stateside stations could be heard well into the evening. One callsign that stood out was JR4ISF/CE0 (an unlikely combination!) who appeared from Easter Island. Others worthy of note were PJ6/AA4OV, HK0FXX, LU1ZA, TL8PS, ZK1DD and 9L1EY. Several V51 stations had been heard from Namibia.

21MHz was good in parts, with a goodly share of the DX on offer. The Pacific had been reported in the shape of KX6EL and JH1MAD/JD1 (**Ogasawara Is**). P29VMS had been heard operating from both **Trobriano** and **Louisiade Islands** and JG3KUT/CE0 had been noted. SD1LYNX was also heard. This was the Lynx DX Group's expedition to SO1 (there have only been a few four-letter suffixes that I can recall — for example HC1NDXC [... and of course there was U5ARTEK and TG0FRACAP]. Other 21MHz DX included DL7ALC/HZ, J34YL, RB3MR/JT and N3CRH/TJ.

28MHz had been quite poor. TY1DX and FT5XA were perhaps the best reported, but others included A61AD, C56/G4LJA and 3B8FV.

The low bands had provided little real DX, but some of our LF stalwarts came up with these. On 7MHz: W9DCN/C6A, JA1BRK/DU1, TU4DH, ZD8PJ and 9Y4GA. On 3.5MHz: AP2KS, A92KS, CD6CD, EL2WK, J6LDC, TL8WD, YC0WWL and ZF2ND.

Brad Bradbury BRS1066 mentioned his participation in the BERU Contest. His loggings included C5, P29, VS6, ZD7, 5N, 5Z, 6Y and 9J, together with a good number of VK's and ZL's.

QSL RETURNS

Robert Small BRS8841 mentioned several good direct QSL's — FR5AI/G, V63AO and 5H1TW (**Zanzibar Is**). Brad Bradbury noted two new oblast confirmations in the shape of UI7K/UA9SFV (Obl.024) and UA3GDJ/UD2N (Obl.002) bringing his total to 167 from 181 heard.

UBA AGM

The UBA's 1990 General Meeting will be held on 26 May. The highlight will be a slide show by Einar LA1EE of the 3Y5X expedition to **Bouvet Island**. Jan DN6JG has asked me to give the event some publicity in Britain in the hope that some British amateurs will make the trip. Further details are provided with the UBA handout, the text of which is reproduced here.

DX NEWS

It is likely that **Rotuma Island** will be active again this month courtesy of VK2BCH. For prefix hunters, SI8MI (the SM part of **Market Reef**) will be active from the end of May until early June. Nearer home, LA7DFA will sign JX7DFA on all bands emphasising CW operation until July 27. As mid-June approaches, Jan Mayen will be almost in constant daylight when operation on the low bands will be almost impossible. One which was in the rumour class at the time of writing was the possibility of KD7P/KH7 operating, mainly on CW, from **Kure Island** sometime in May. The special call CF25A was active until the middle of last month. Those who heard it will wish to know that it was aired by VE3XN to celebrate the 25th Anniversary of the Canadian flag. QSLs can be obtained from VE3XN. Finally in this section, Y90ANT will be active from Georg Forster Base on **Antarctica** for one year starting last month. DSL via Y21RD.

50MHz

Some activity to report this month. Stations from **Africa** had been heard in the South East in March. 9L1US (ex J52US), ZS3SW (G8WNP) and many ZS's had been mentioned to your scribe in discussion with several 50MHz buffs.

However, we now wait in anticipation of the Sporadic-E season. With the increased European activity, this summer should indeed be the best so far. Since last year's Es season, stations from HB9, LX, DE, ON and DY are now active on the band. There were rumours that other administrations were to release the band in April, but only time will tell if they were April Fool Jokes!

FINALE

That's all for now. Please ensure that contributions for the July issue reach your scribe by Monday 23 May. I will be especially pleased to receive details of stations which have been active during May, together with any VHF news which might be available if we are blessed with some good tropo (what's that?) and an early start to the Es season.

RSGB QSL BUREAU – MOVE COMPLETED

Ted, G3DRN, and Aileen Allen pictured in the newly expanded RSGB HQ QSL Bureau.

The completion of the move of the QSL Bureau to our Headquarters at Potters Bar takes place on 1 May with the transfer of the outgoing service.

There are two ways in which to assist the smooth running of the Bureau.

Firstly, ensure that your cards are sorted in the correct manner. That is alphabetical by prefix and by call area in the case of cards for the USA, with the proviso that all cards for a given country are sorted together, including the prefixes used for contests, DXpeditions and special events. Also remember that if a QSL Manager is involved the card goes to his own country, whereas cards for a reciprocal licensee go to his home call.

The second point is to use the IARU recommended card size, which is 5.5 by 3.5 inches. Larger cards have to be folded or, at best, arrive at their destination with damaged edges. We have also found that having various sizes of card is a contributory factor in mis-sorting, and can cause packets to come to grief in transit. It would be appreciated if those in the QSL card printing trade could note this.

Some amateurs, especially the newly licensed, complain about delays. Cards are never deliberately held up - in fact the whole job is based on shifting the cards as quickly as possible to avoid a huge storage problem. The most common delay is in the addressee of a card waiting until he receives it through the bureau before responding. New licensees should be aware that it is quite normal to wait 6 months for the first cards to come back via the bureau system.

THE RETIRING QSL BUREAU MANAGERS

The husband and wife team of Ted (G3DRN) and Aileen Allen have run the RSGB QSL Bureau since they took over from Arthur Milne, G2MI, in 1977. Prior to that, Ted was a Sub-Manager for 15 years dealing with cards for G3R, S and T series, G3+2, G4+2, G5 and the Channel Islands. With the move of the Bureau to HQ, they are embarking on a well-earned retirement.

An RSGB member since 1942 and licensed 6 years later, Ted favours 7MHz cw operation and spent nearly ten years operating exclusively on cw. Prior to being employed by the Society, Ted was a Securicor radio operator, a salesman, and an office manager. Before that he was in the RAF.

London to New York

Ted and Aileen have sorted some 2.5 million QSL cards each year for 12 years or enough cards to reach New York if laid end to end. The worst cards to sort are those which are ordinary picture postcards as these are frequently a different size or shape to the others. Amongst the occasional complaints, the Bureau has received many thank you notes. Often these are on little scraps of paper enclosed with a batch of cards. They are nonetheless much appreciated and help make the job much more worthwhile.

Wedding photos

Some strange things have been sent to the Bureau over the years, including packages with Post Office Savings Stamps on, and cards each bearing a postage stamp. CB cards occasionally arrive as the Post Office tends to forward to Ted any loose QSL cards. Probably, the most curious occurrence was receiving a bundle of wedding photographs, obviously put in the wrong envelope. Unfortunately, we shall never know what the proud parents thought on opening their daughter's wedding snaps only to find a batch of QSL cards! With some clever detective work, it was established that the photos had come from a particular radio club but there was no response to Ted's letter to the club.

Retirement

Ted and Aileen have mixed feelings about retirement from a job which they have found satisfying for so many years. They will, however, appreciate the end of the late-night phone calls from members. They are also discovering parts of their hall and stairs which have not seen the light of day since the first QSL card sacks arrived. Ted is not giving up the Bureau entirely. He has been appointed QSL Manager for the GDN series. Oh, and the obvious question — does he QSL? He is (of course) the model QSLer and sends only one per each new county worked.

A letter from Ted Allen ...
30 Bodnant Gardens,
Wimbledon,
London
SW20 0UP

Following the correspondence concerning the Bureau in Last Word earlier this year, may I express my appreciation of the many messages of support received from members, including one gentleman who telephoned me from the Shetlands.

I would also like to take the opportunity of thanking members for their messages of goodwill not only during the past twelve years when sending cards to the Bureau, but more recently in connection with my impending retirement. There are far too many for me to reply to individually.

Although, as in all walks of life, one sometimes encounters an S1 mentality hiding behind an S9 voice, there is ample evidence that the "Ham spirit" is very far from being dead, which augurs well for the hobby and for the RSGB.

Thanks are also due to the management and staff at Potters Bar for all their assistance, remembering also the manner in which Council Members and Committee Chairmen always handled correspondence from me. I'm very grateful.
E G Allen, G3DRN.

All QSL cards should now be sent to:-

RSGB QSL BUREAU
PO BOX 1773
POTTERS BAR
HERTS
EN6 3EP
ENGLAND

Please do not send any more cards to the old address in Wimbledon as they are likely to be delayed. No responsibility can be accepted for those which are wrongly addressed.

ICS Electronics Limited
Unit V, Rudford Industrial Estate, Ford, Arundel, West Sussex. BN18 0BD
Telephone 0903 731101 Facsimile 0903 731105

DATA AND IMAGE TRANSMISSION

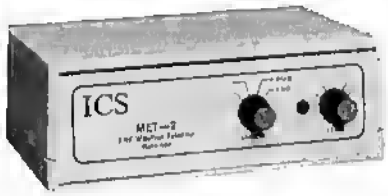
MET-2 Geostationary Weather Satellite Receive System

ICS's MET-2 geostationary weather satellite receive system gives excellent images from either the European Meteosat or the American GOES satellites.

In Europe, updated weather pictures are available live and in incredible detail every half hour - directly on the screen of your IBM-PC(*), Amiga or Atari computer.

This system is extremely easy to use, and the IBM-PC VGA graphics display clarity is simply stunning. Send for further details.

MET-2 System: £599.95 plus VAT (£9.50 p + p)



AVT FAX/ SSTV Transceive System for the Commodore Amiga

This is a truly remarkable new system from AEA, which is likely to become a new world standard.

It caters for every Fax and SSTV mode known, as well as a host of new improved modes of its own.

Large chunks of a colour SSTV picture can be lost in the noise, yet the entire picture can still be recovered by the receiving station!

If you own an Amiga computer and want the ultimate image transmission system, write for details.

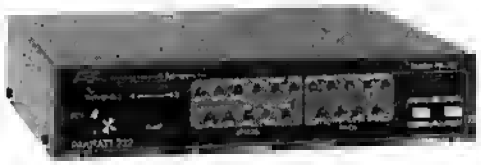
AVT System: £299.95 inc. VAT (£5.00 p + p)

PK-232 Multimode Terminal Unit

The PK-232MBX is undoubtedly the world's most popular terminal unit for use on HF. Its modem design is second to none, and the firmware has been refined through numerous upgrades. Future upgrades will continue to keep the PK-232 ahead of the competition.

It covers Amtor, Packet, RTTY, Fax, ASCII, CW and Navtex. Software for the IBM-PC and Commodore 64 are included in the price. The PakMail mailbox upgrade is now standard equipment.

PK-232MBX: £319.95 inc. VAT (£5.00 p+ p)



PK-88 Packet Radio TNC

The PK-88 is a sister product to the PK-232, giving the same excellent performance, but on Packet only. It uses the same Host Mode command structure as the PK-232, and operates on HF as well as VHF. A PakMail mailbox is built in, and the strong metal enclosure has an excellent front panel status display. Easily the best value in Packet Radio only TNCs.

PK-88: £139.95 inc. VAT (£5.00 p + p)

AMT-3 Amtor/RTTY Terminal Unit

This is a new product from ICS, which offers the same low cost entry to Amtor and RTTY on the HF bands as the PK-88 does to Packet Radio. Amtor is by far the best mode for HF data communication, and the AMT-3 provides all the features needed for superb results in one tiny package. It has a modem optimised for these modes, non-volatile configuration memory and superb front panel status and tuning indicators.

AMT-3: £189.95 inc. VAT (£5.00 p + p)

MM-3 Morse Keyer

If you love CW, you'll love the MM-3!

For the advanced operator or contester, the MM-3 provides 4,400 characters of storage in 20 memories with Lithium battery backup. Automatic serial number generation speeds up contest operation, and beacon mode permits ease of DXing on a quiet band.

For the newcomer to CW, multiple training modes and a real time QSO simulator take you all the way from zero to competent operation before ever having to have a live QSO. You can look forward to your debut on the air with complete confidence, and then use all of the MM-3s advanced features as you become more experienced. An RS-232 computer interface is provided.

MM-3: £169.95 inc. VAT (£5.00 p + p)

TECHNICAL TOPICS

PAT HAWKER G3VA

TAMING THE STATION COMPUTER

I must confess that I have never felt any great desire to install a computer as part of G3VA — but equally I recognise that by now this is a minority view regarded by the majority in much the same way as my personal preference for brass keys and copying morse with a ball-point pen! For it is clear that the marriage of radio-communications and computers has been consummated in many amateur radio shacks — although not always without a few lovers' tiffs and tears in the process.

A useful eight-page article "Amateur Radio and Computers" by Wolfram Wagner ZS6KE (**Radio-ZS**, August 1988) was aimed at smoothing the way to happier marriages: "In our hobby very few technical innovations have gained ground as rapidly as the 'microcomputer' — the properties of these fascinating devices have cast a spell on an increasing number of radio amateurs" — as ZS6KE puts it. He outlines the differences between the 8-bit home computers (from the simple ZX80, ZX81 to the rather more complex BBC, Acorn, Commodore etc) which usually have some built-in programming, mostly in a reasonably standard version of BASIC and the 16-bit or 32-bit personal computers (IBM PC or PC-compatibles by other makers). The PC family have all the units and features of the home computers coupled with a general and more universal user level. (**Fig 1**) ZS6KE believes that the 'general' nature of the PC makes it a very powerful tool for the amateur but considers that it does require a certain amount of experience before a user becomes fully accustomed to just what can be done with it. In practice, the more complex versions of 8-bit home computers can perform many but not all of the functions that the 16-bit and 32-bit PCs provide.

Much of his article is concerned with the many ways in which either the "stand-alone PC" or the "PC connected to your station" can be used on a variety of tasks and the necessary interfaces. Such material is rather outside the scope of *TT* but what does seem worth quoting at some length is his section "Considerations in the shack" (including RFI suppression hints). He writes: "The most restrictive property for the use of any digital electronics in a radio amateur's shack is the intense RFI these devices generate. This interference ranges from VLF right up to microwaves, and above as digital electronics uses higher and higher switching speeds. For this reason it is important to ensure that the device you acquire has some commerical guarantee: FCC number, FTZ number, BS 6527 etc. (In the UK, there is still no legal requirement that computers must meet BS 6527 EMC standard.)

"Such specifications indicate the radiation limits the unit is *supposed* to satisfy. In spite of this certificate, you will find most units still radiate more than the acceptable amount of noise and you have no other option but to use all your skill (or that of your friends or acquaintances) in suppressing the noise to an acceptable level. The following are some of the ways this can be tackled:
(1) Provide a fully graded (BS/VDE/SABS etc) power-line suppressor (RFI filter) in the power cable of the computer.
(2) Ensure that external units (printers, display screens, plotters) are also suppressed by a similar power-line suppressor.
(3) Be very careful that the ground (or earth) on the different units do *not* form "earth loops" via the signal cables.
(4) Try to place *all* the equipment in the shack on a common ground-plane (steel shelving, steel desk or copper foil) which is grounded to *one common ground* (your station earth if you have one).
(5) In severe cases it may be necessary to suppress any power lines to your radio equipment (see (1)). This may also get rid of any TVI or telephone interference in your system.
(6) You may also attempt to place ferrite ring suppressors on the coaxial cable feeder to your station and in some instances even up at the junction to the antenna to choke any RFI that travels up your feeder.

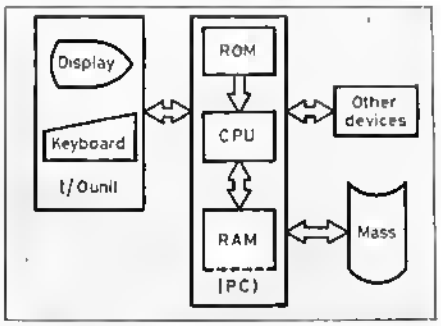


Fig 1. Basic structure of a microcomputer installation. ROM Read Only Memory. RAM Random Access Memory. CPU Central Processing Unit. Mass Storage Memory (external).

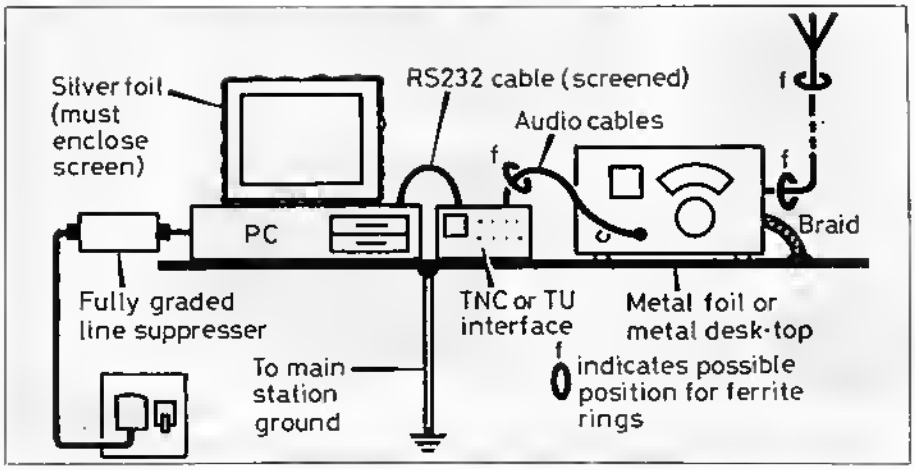


Fig 2. ZS6KE's suggested EMC measures to reduce RFI problems arising from digital equipment forming part of an amateur station.

"The easiest manner to find the source of the interference is to disconnect each unit in your shack until the interference vanishes. From personal experience I can say that display screens can be the cause of some very irritating interference. This can be suppressed by literally wrapping the case of the unit in foil (make sure that you **don't cover ventilation holes**). The more adventurous may place this screening inside the cabinet by glueing it to the inside of the cover with contact adhesive. "In homemade digital circuitry it is important to ensure that the board is constructed along the lines of good VHF/UHF designs using ground planes and plenty of decoupling capacitors on power lines. **Fig 2** shows some measures that may be necessary (not guaranteed!) to suppress RFI from your computer."

RSI, "KEYBOARD CRAMP" AND "BRASS ARM"

The past few years have seen growing concern in commerce, journalism and the Information Technology (IT) industry with an obscure and still controversial medical condition affecting some keyboard/VDU operators — the fact that cases have occurred in the computerised newsrooms of newspapers and broadcasters has ensured that this condition has been widely reported by the media. Commonly called RSI (repetitive strain injury) or "occupational overuse injury" or, by the medical profession, "upper limb disorders", it does appear to be the re-emergence of what many years ago was known as "telegraphist's cramp" or, more colloquially as "brass arm" that in the 1920s affected a small minority of professional line and radio telegraphists using up and down brass keys and a smaller number of teleprinter keyboard operators. In spite of the evidence that accumulated over many years of this medical problem, many doctors still refuse to accept that RSI really exists — but firms are being forced to take the condition more seriously since the award in an out of court settlement of £45,000 to a bank employee who spent much of her time using a computer keyboard under strain inducing conditions.

Telegraphist's cramp was no joke — in severe cases experienced operators lost completely the ability to manipulate a morse key and, in its final stage, "telegraph operation becomes a matter for dread and the emotional repercussion may be such that the touch, sight or even memory of a telegraph instrument and its working may induce intense apprehension, tachycardia, tremors, hyperidrosis or loss of emotional control" — to quote from a long, unpublished, monograph written in the late 1930s by Colonel H V Prynne, CBE, DSO, FRCS a retired Chief Medical Officer of the GPO, a typescript of which I recently unearthed in the Post Office Archives, London.

I recall from the 1940s a former marine Radio Officer then working as a civilian for Special Communications who was suffering from "brass arm" to the extent that he could only be allocated listening watches for clandestine stations that were no longer expected to come up on schedule. It had become virtually impossible for him to send readable morse and he had become what was then known as a "bundle of nerves". Although there seems little evidence of amateurs using morse keys or keyboards being affected by brass arm, it could well account for why some former CW enthusiasts decide to abandon the key for the microphone.

Recently, *The Independent on Sunday* (25 February 1990) devoted a whole page to RSI and a new document being issued by the Health and Safety Executive: "Work Related Upper Limb Disorders: A Guide to Prevention." This reflects advice from ergonomists, medical experts and representatives from trade unions and employers' bodies. It is suggested that the problem primarily

SIMPLE RS-232C TO KEYING-LINE INTERFACE

John Swancara, WA6LOD in *QST* (February 1990) reports the use of a cheap and quick computer-to-keying line interface as follows: "While experimenting with my Tandy 1000 home computer and some ham code generation programs, I learned that the computer's RS-232C DTR line switched from +14 to -14V when the programs executed the code. In about one hour, with a few radio shack parts, I built the interface shown in **Fig 3**. It works great and easily keys my transceiver. I now send perfect CW!

"When the Tandy 1000's +14/-14V DTR signal switches to -14V the optocoupler's LED turns on the output transistor, pulling the circuit's output line low. If you need a circuit that goes low on positive excursions of the input line, just reverse the 1N914 diode and the connections to pins 1 and 2 of the optocoupler. If keying your rig involves switching a higher voltage than the optocoupler can handle, you can control a DC relay with the optocoupler and key the rig with the relay."

If you prefer an all-solid-state solution rather than using electromechanical relays, an article in the same February issue of *QST* describes "Simple Control-Signal Level Converters" on pages 24-27.

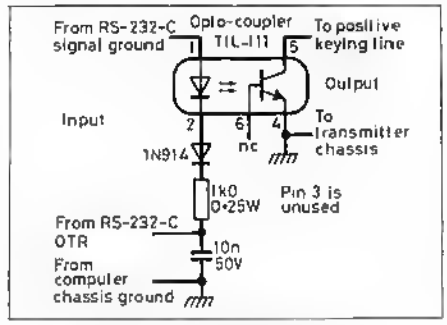


Fig 3. WA6LOD's RS-232-C-to-keying-line interface requires only four components on a piece of scrap copper-clad circuit board.

affects people who do relatively monotonous, repetitive work while in a fixed position; the risk factors appear to be bad working posture, high frequency of hand movements coupled often with a degree of forceful exertion and poorly organised work processes.

Col Prynne suggested that "Telegraphists Cramp is a disease of the central nervous system, and is the result of a weakening or breakdown of the cerebral controlling mechanism in consequence of strain upon a given set of muscles, characterised by visible spasm of hand or arm during the manipulation of a telegraph instrument and by the impairment of the power of making the required co-ordinated movements. Before any cramp or spasm is apparent there may be a stage characterised by subjective symptoms only, where the operator feels pain or discomfort in the operating hand or arm." A feeling of stiffness or loss of control "as if the muscles would not do what was required of them" or undue apprehension was sometimes the first symptom.

In the 1920s, the GPO employed some 20,000 male and female land-line telegraphists sending and receiving telegrams at working speeds of around 25wpm. Col Prynne investigated some 313 cases that appeared in the years 1921-30 and considered an additional 147 cases that had been reported between 1905-1920. Of the 313 new cases, some 168 responded to treatment directed at re-establishing the confidence of the operator — often after a period of complete rest from telegraphy. He estimated that about 2 per cent of GPO telegraphists were affected at some time (many within two years of qualifying). He sought information from other countries. Several, including the USA (where brass keys were not commonly used), reported only negligible numbers of cases, but Norway replied that over 5 per cent of their operators suffered manipulative difficulties in the form of 'telegraphists' cramp". With the phasing out of hand-Morse and the introduction of teleprinters, the number of cases in the GPO dropped dramatically but did not disappear entirely. The GPO authorities, however, (as apparent from correspondence in the archives) were anxious that if Col Prynne found a publisher for his monograph, all references to teleprinter-operator's cramp should be deleted!

Col Prynne clearly recognised that the condition could be produced by either physical or psychological causes. Yet it is only recently that modern RSI is not being written off as psychosomatic. This all adds up to an inducement for amateurs to ensure that their operating "environment" provides comfortable, relaxed operating conditions — and perhaps a reason to avoid over-intense extended periods of strain-inducing operating such as can arise in some contests. Such advice applies not only to CW and keyboard systems but even with hand-held microphones — at least one sufferer from RPI claims that she cannot pick up a fork or hold a telephone instrument without pain. Nor does one have to be a "senior citizen" to be affected by upper limb disorders — remember that the GPO found that many of their young telegraphists could be affected within the first two years of qualifying.

BALANCED ATU FEEDS OPEN-WIRE LINES

TT has frequently pointed out that the radiating element of a doublet or dipole antenna fed by an open-wire transmission line does not itself have to be of resonant length in order to radiate efficiently — always provided that the complete antenna system is brought into resonance by being correctly matched to the transmitter. The high SWR that can exist happily on open-wire, low-loss feeders (though *not* between the ATU and the transmitter) is demonstrable proof that very little of the energy reflected back down such a feeder (so setting up the SWR) is lost but subsequently is radiated from the element. With an effective ATU and open-wire feeder a 132ft centre-fed dipole does not (contrary to the still often held belief) radiate significantly more power on 3.5MHz than would say a similar dipole with an 80ft top fed with the same transmitter output power. Equally important is that such an 80ft dipole, with suitable ATU, can radiate very effectively on any frequency from about 1.8-30MHz (or higher), although the horizontal and vertical radiation patterns will differ.

Richard L Measures, AG6K in "A Balanced Balanced Antenna Tuner" (*QST*, February 1990, pp28-32) points out: "Now that we have nine amateur radio bands below 30MHz (not all harmonically related) an open-wire line, centre-fed-wire antenna system looks even more attractive than it did when such antennas first came into popular use in the 1930s when we had only five bands (all harmonically related) below 30MHz, viz 1.75, 3.5, 7, 14 and 28MHz). Taking advantage of this versatile system requires a box that will interface the 50ohms unbalanced output of today's transceivers to the highly variable impedance (Z) of the balanced feed points of such multiband antennas."

He considers, however, that most of the contemporary "matches everything, balanced or unbalanced" antenna tuners produce only a semi-balanced output when used with a balanced load. This, he suggests, can result in a less than wonderful situation: "Antenna tuners are like shovels. It takes more than one kind of shovel to perform a variety of jobs effectively ... no single antenna tuner circuit can do every antenna-matching job extremely well. A balanced-load tuner should be designed — from the ground up — for the job it is intended to perform." He describes an ATU specifically designed for feeding open wire, ladder-type, transmission lines on a variety of frequency bands, stressing that this arrangement **(Fig 5)** cannot (or at least should not) be regarded as suitable for unbalanced loads such as a coaxial cable or for end-fed Marconi or Hertz antennas.

His tuner depends on a choke balun made from a length of coaxial cable wound on a plastic-pipe former. With a 3·5in diameter pipe, about 30ft of 50ohm cable should form an effective balun at frequencies between 1.8-30MHz. If 1.8MHz is not

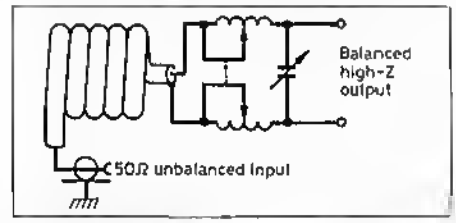


Fig 5. AG6K's carefully balanced ATU for feeding multiband wire-doublet antenna via open-wire feeders. The ATU is capable of feeding a wide range of reactive impedances but not intended for use with unbalanced feeders or end-fed antennas. Physical and electrical symmetry and balance should be maintained.

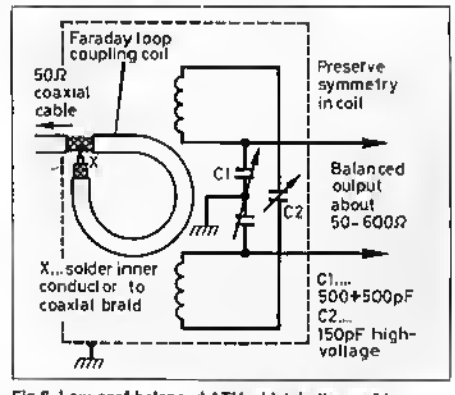


Fig 6. Low-cost balanced ATU which in the past has proved useful for feeding 300-ohm or 600-ohm matched balanced feeders on 14/21MHz with pi-network and Faraday-loop coupling coil.

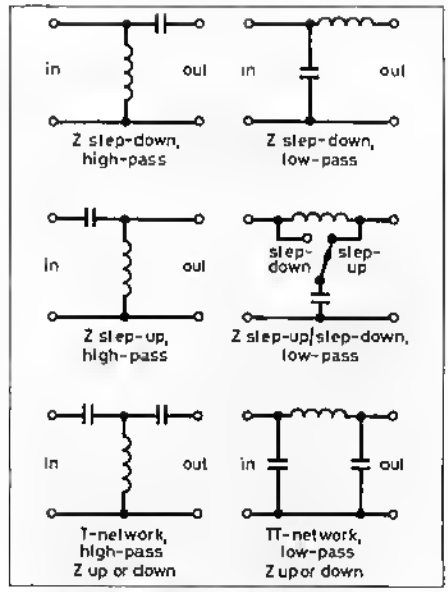


Fig 4. Basic unbalanced RF matching networks.

required about 18ft of cable should suffice. The ends are fastened to the pipe using nylon cable ties. Solid dielectric cable is best for this application. Layout and components should be arranged to maintain good RF balance; good symmetry is important on the higher frequency band. Unless you have two identical roller-coaster inductors in your junk box, such a tuner will be quite costly to implement with new components although costs can be reduced if you can find a source of surplus-MoD components etc. The variable inductors need to be driven in synchronism by one tuning shaft. A less flexible but lower cost unit could be made using tapped inductors with switched selection of the taps. An even cheaper arrangement which has been used at G3VA for feeding 300ohm folded dipoles on both 14 and 21MHz with a single split coil and pi-network is shown in **Fig 6**. This uses a Faraday loop type of balun which also helps reduce harmonic output.

MORE ON FET POWER AMPLIFIERS

Recent *TT* items on the use of low-cost audio and switching FETs as amplifiers capable of providing up to about 50 watts of RF output (eg *TT* February 1990, December 1989) have prompted Tim Walford, G3PCJ to report on the results achieved in the past two years with two such amplifiers: one using IRF510 devices from 12V supplies; his preferred second method using VN88AFD devices from a 35V supply. He writes: "My first experiments were with the IRF510 because it was/is the fastest of this family of devices having low 'on' drain-source resistance (Rds(on)) and thus suitable for use from 12V supplies. With four of these devices in a parallel push-pull arrangement (**Fig 7**) I have obtained 50W pep on 3.5MHz with 1 watt of drive using a 12V supply. Parallel operation is possible with these devices and they are relatively destruction-proof! I do however recommend that the DC bias is arranged always to be applied after the antenna relay has connected the load; this is the purpose of the large value capacitors on the gate/bias line. Broadband operation is possible using untuned toroidal transformers.

"This amplifier is suitable for 1.8 or 3.5MHz but not for 7MHz or higher-frequency bands. The layout is not too critical and the capacitor between the drains helps dramatically to improve the waveshape of the output. The gate bias voltage is adjusted to provide the best compromise between maximum output and minimum distortion (typically about 1A for all four devices). If the drain capacitor is omitted some (although much reduced) RF output is possible at 7MHz; it was this limitation that led me to use the VN88 series of devices in the amplifier shown in **Fig 6**; this is my current design for use up to 30MHz. The VN88 devices have a much higher Rds(on) than the IRF510 and need a higher supply voltage. Both these types of devices are relatively inexpensive (about £1.20 per device) and I feel that it is unnecessary to incorporate any form of ALC in these amplifiers, provided that the output load is tuned up at low power or with a bridge that restricts the range of impedances presented to the amplifier. Good heat-sinking is very important since the FETs operate near to the limit of their power ratings. I have mounted both versions in tobacco tins with the heatsink on the outside; the tins form an excellent ground plane. The VN88 design dissipates rather more power than the IRF510 due to the device's higher Rds(on). The better heatflow properties of the VN88AFD in the TO220 package is to be preferred to the more commonly available VN88AF (all four VN88AFs blew on one occasion and were replaced by VN88AFDs).

"The VN88 amplifier is very similar to the IRF510 design except for the supply voltage and

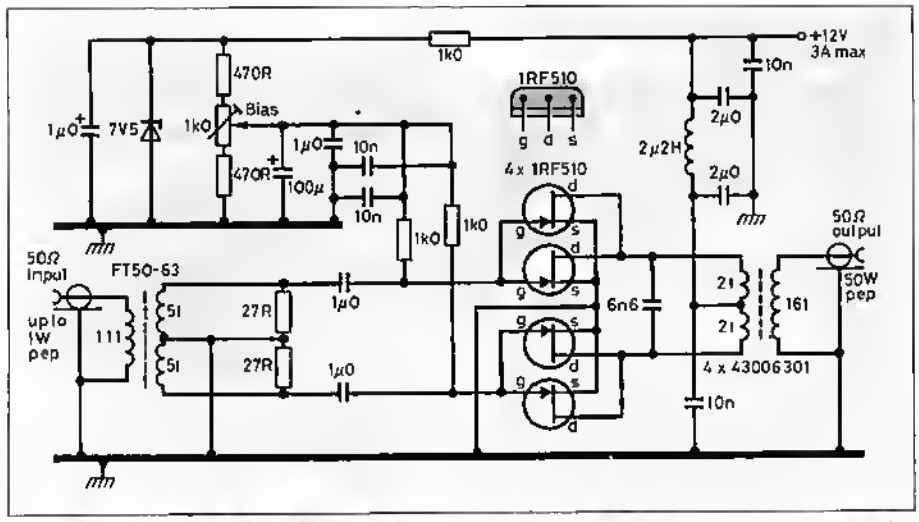


Fig 7. G3PCJ's broadband RF amplifier capable of providing 50-watts PEP output on 1.8/3.6MHz from a 12V supply. It uses four IRF510 devices in a parallel-pushpull configuration. Bias control set for about 1A (total) standing current.

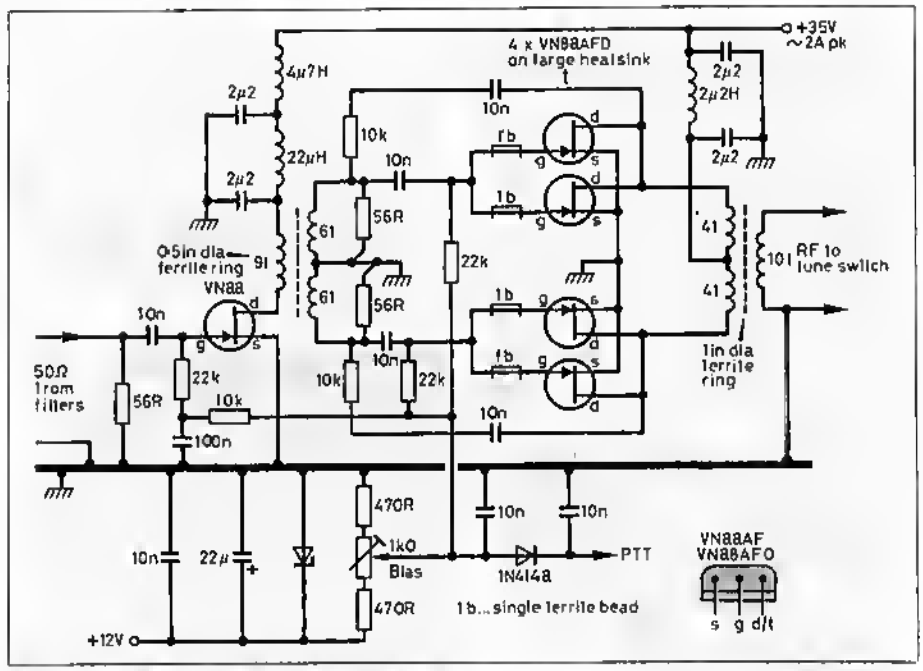


Fig 6. G3PCJ's "Mk II" FET amplifier capable of use to 30MHz. It provides about 50W PEP output from four VN88AF or (preferred) VN88AFD devices from 35V supply. Bias adjusted for a standing current of about 0.75A (total).

output transformer. Because the drain voltage of the VN88, when 'on', is about 10V, a supply of up to about 40V may be used while still keeping within the rated 80V Vds limit. Since, in my case, I crammed both stages into one tin, stability was more critical than would otherwise have been the case; I found some negative feedback was required — but other constructors might find it possible to omit the 10k resistor/10nF capacitor between gate and drain. In this design, the diode to the PTT line kills the DC bias as soon as the switch is released, thus reducing the chance of damage when the antenna relay opens (I use a PTT switch between +12V and relays to earth.)

"Both amplifiers have been extensively used, but I now favour the VN88AFD design owing to its greater bandwidth. These devices will work to even higher frequencies than 30MHz provided that a low gate-driving-impedance is used to counter the high gate-input-capacitance. Incidentally, I do not believe that a highly-regulated supply is required since the devices must not be allowed to 'bottom' since this causes RF clipping, harmonics, splatter etc. Any residual ripple from a simple bridge-rectifier/smoothing-capacitor PSU is rejected by the RF output "transformer."

Tim Walford, G3PCJ recognises that these notes may be a little cryptic to those without a very great deal of previous experience of building FET amplifiers. He is more than willing to assist in suggesting sources of components, etc (Telephone Long Sutton (045824)n 224 or (with SEA) Upton Bridge Farm, Long Sutton, Langport, Somerset).

POT-POURRI

Ray Hill, GM0IJF apologises that the outline of his battery-charger (*TT*, January 1990, Fig 9) could have proved misleading since with the polarities shown it would switch 'on' instead of 'off' when the battery voltage rises. He has sent a full circuit diagram (**Fig 9**) of his charger which has served him well for a considerable time: "In **Fig 9** the 33K resistors at the inputs of the 741 op-amp allow me to put the reference zener-diode *and* the feedback on to the non-inverting input of the 741. The 33k resistors and the 22µF capacitors were originally put in to get rid of picked-up noise, which seemed rather bad in my case."

NTT, the Japanese telephone company, has stopped using lithium rechargeable batteries in mobile radiotelephones after an accident which injured a user, following a short-circuited battery. Firms in this field are expected to stick to nickel-

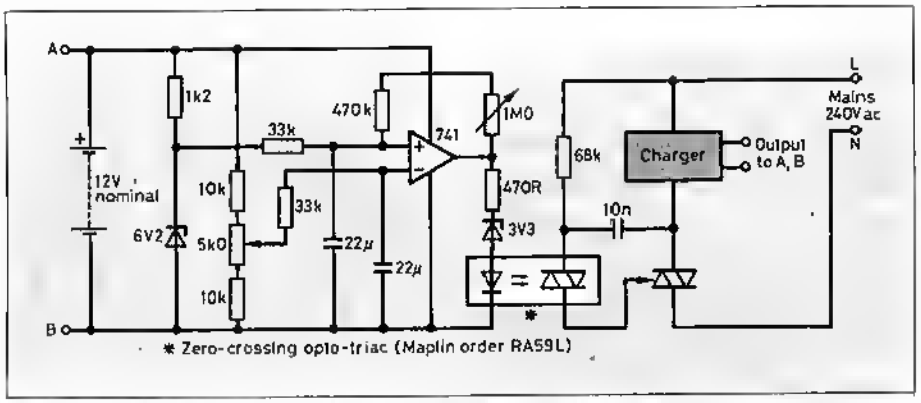


Fig 9. Circuit details (with corrections) of GM6IJF's lead-acid battery charger controller (see January *TT*, p35).

cadmium rechargeables in the near future — Noted in *ABU Technical Review* (January 1990).

A *QST* article points out that when using a vacuum-variable-capacitor it is important to realize that the maximum RF-voltage rating at 30MHz is usually only 60 per cent of the rating for DC or 60Hz AC peak-voltage rating. Thus a 5kV DC/60Hz rating is roughly equivalent to a 3kV peak RF rating. Used or surplus vacuum capacitors need to be checked before use since they may have developed an air leak that renders them useless.

G3KSU is concerned that amateurs should be at least extremely circumspect in considering promotional material and advertisements for an American "automatic antenna matcher" (priced at almost $500 for a 150W rating) which, in effect, seems to be based on using a dummy load to bring the transmitter SWR down with only a small proportion of the power diverted into a non-resonant short antenna. Remember the old tag "let the buyer beware" and study the explanations carefully.

BOUNCING BEAUTIFUL RF SINE WAVES

The long-term future of amateur radio clearly depends on arousing and maintaining the interest of young people in the art and craft of radio communication — something that at present we seem to be failing to do. We need, perhaps, to think more carefully about just why the hobby (or specific parts of it) has been able to retain the interest of so many of us for so many years. In *QST*, Eric Nichols, KL7AJ puts forward an individualistic view that may not be so far off the beam:

"Just about my entire career, as a broadcast engineer and active amateur, has been devoted to the generation of RF energy. I can think of little else I'd rather do. And yet I have discovered that most of the people who do what I do are at least a generation older than I am ... Good RF engineers are almost impossible to find. Industry is wondering where the next crop of technicians and engineers will come from.

"Why has this discipline of radio — at one time the very heart of electronic technology — come to the point where people consider it an arcane science? I have been forced to consider what first attracted me to radio during my formative years. I liked radio because it was *aesthetically* appealing. I was not nearly as impressed by the capabilities of radio as by the very nature of radio. Radio is great, not because of what it does, but because of what it is. Nobody buys an original Da Vinci painting to cover a hole in the wall. By the same token there are other means of communication that are more efficient than bouncing signals off the ionosphere; but the very fact that we can bounce signals off the ionosphere makes it worth the effort. "Maxwell's equations appeal to the body, soul and spirit. Sine waves are veritable works of art. Antenna radiation patterns are beautiful. "It is incumbent upon radio initiates to convey the mystique and aesthetic aspects of our hobby to newcomers. To fail to do so is to doom our hobby and the radio profession to the status of a lost art."

It is apposite to recall that "PP" Eckersley, (G)200, the first Chief Engineer of the BBC (1923-29) and a Vice-President of the RSGB, once admitted that his attachment to "wireless" as a schoolboy from 1906 onwards was, at least initially, an emotional one; brought about by his delight in the then colourful artefacts — the bright green coils, the black ebonite panels, the brass switches and morse keys, the crackle of the spark coils. This was rather than the deeper scientific interest of his brother T L Eckersley who became an outstanding research physicist and unravelled many of the mysteries of HF propagation.

LOW-POWER 12V-TO-30V DC/DC CONVERTER

By using a 555 IC "chopper" working at about 100kHz and a voltage multiplying diode rectifier arrangement, it is possible to build a simple converter (Fig 10) providing a stabilized 30V DC output at about 30-40mA when powered from a 12V car battery. This design comes from the February 1990 issue of *Electronics Australia* as a means of powering an *EA* 144MHz 1-watt transmitter (November 1989) from a single 12V source. (In this equipment the 30V line is required only for the LM351/LM386 audio amplifier, the RF circuits being fed directly from 12V or, in the case of the VXO, from a regulated 5V.) It is stated that the arrangement of Fig 10 can deliver up to about 13mA from an 11V supply, increasing to 28mA at 12V and 43mA at 13V.

The solid-state inverter and/or switched mode PSU is today the accepted method of powering equipment from a variety of sources — AC mains, low-voltage DC — to provide almost any required output voltages and powers. In this respect, solidstate technology has taken over completely from former mechanical conversion techniques that today have lapsed into history, but were in common use up to the mid-1950s. For car radio receivers and low-power "suitcase" transmitter-receivers, the 6V and 12V "vibrator units" provided chopper frequencies of around 100Hz and could in fact be surprisingly efficient (up to 90 per cent or so conversion efficiency). Unfortunately vibrators suffered from limited lifespan, mainly because the contact points tended to become pitted and to stick — a problem that could sometimes be overcome by subjecting them to a sharp tap on switch-on. Repair was sometimes possible by filing the points and adjusting the spring tension and gap, but such measures usually afforded only temporary relief.

It is worth remembering that for all equipment operating at low input voltages, the main on/off switch has to carry a relatively high current, and any resistance introduced by dirt or oxidation, or caused by arcing, can drastically reduce the efficiency of the unit. This applies to solid state inverters as well as those relying on mechanical devices such as vibrators. Where powers of from about 30-watts upwards were needed for portable or mobile transmitters, the usual solution was a rotary conversion machine. This could be a rotary transformer (ie dynamotor) with a single armature, wound with two separate windings, each connected to a commutator at either end, and excited by a common field system. Any DC ratio could be obtained with a suitable ratio of turns in the windings, but overall efficiencies were lower than for vibrators, often delivering from 50 to 500 watts with overall efficiencies ranging from about 50 to 60 per cent.

Whereas a rotary transformer (dynamotor) is a DC to DC device, a rotary converter converts DC to AC and vice versa. It has a single armature winding, from which tappings are connected to slip-rings at the AC end of the machine and to a commutator at the DC end. The AC/DC transformation ratio is fixed by the number of phases and is equal to root-2 for a single phase machine. The motor generator was perhaps the most versatile of the rotary converting machines, and may still be used for high power installations. It consists of a motor driving a separate generator on a common shaft: it is possible to design machines for any voltage ratio, DC to AC, AC to DC, or to change AC from one frequency and voltage to another frequency and voltage, at virtually any power.

DR PAUL EISLER — "MR PCB"

It has been said that every industry has its visionaries, but that ideas, like wine, must be given time to mature. True enough, but unfortunately one result is that many of the great inventors and innovators never receive the public recognition they deserve for their pioneering work. One such is Dr Paul Eisler who in 1943 was the first person to patent the now almost universal form of printed circuit board — an idea he had pursued for years

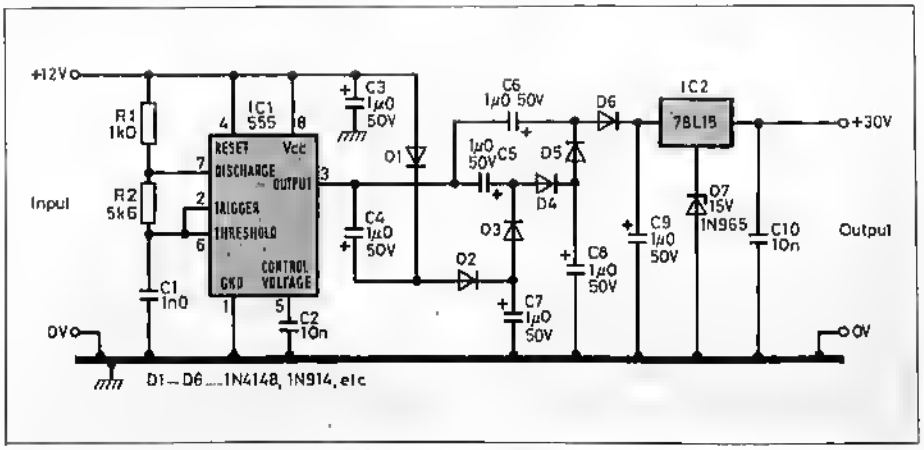


Fig 10. Low-power 12V-to-30V DC/DC converter using 555 IC "chopper".

but which remained little used for more than a decade — despite the efforts of John Sargroove in the immediate post war period to advocate the use of printed wiring for simple, low cost radio receivers for developing countries. Walter Frolic, G0CAO draws attention to Paul Eisler's recently published *My Life with the Printed Circuit* (Associated University Presses, London 1989, 170pp, hard covers £13.95).

Austrian born Paul Eisler came to England in 1936 at the age of 29 years becoming, after the Anschluss in effect, a Jewish refugee. Even while working in Austria, he had become convinced that it should be possible to replace wiring in radio receivers with printed circuits, but like so many other inventors, could not get commercial backing for his ideas. In the UK, he joined Oscar Deutsch's Odeon Theatres as an "ideas man" but in 1940 was, for a time, interned as an enemy alien. When released he set to work on printed circuits in an attic flat. To demonstrate the principles he built a first printed circuit radio receiver which still exists, but was also convinced that PCBs could find application for military applications. The Americans took up the PCB as the basis for the first truly microminiature (Tinkertoy) device, an anti-aircraft proximity fuse that in 1944 enabled many hundreds of V1 "flying bombs" to be shot down before reaching London. With the coming of peace, Paul Eisler tried to interest the mass consumer product industry. It was not until about the mid-1950s that PCBs eventually took off. Even then the path of the inventor was not smooth. Boardroom clashes and quarrels with Government ministries led to resignations. Eisher, at 82, is still an active inventor, with more than hundred patents to his credit.

EXTRA DIODES PROVIDE IMPROVED VOLTAGE-DOUBLER

Dick Rollema, PA0SE in his "Reflecties door PA0.SE11 column (*Electron*, p122) draws attention to an improved voltage doubling circuit that ofers better regulation and less pronounced ripple to the more conventional cascade-type voltage doubler (*TT*, November 1989). This was originally described by the Swiss engineer TH Gisper in *Elektronica* 89/22. With this arrangement, the full voltage output is built up over a single 50Hz cycle instead of the two cycles of the conventional cascade voltage doubler: sea **Fig 11(b)**. With an input of 240Vac, the unloaded peak DC output is approximately 675V. Regulation is governed by the value of the electrolytic capacitors, although the values can in practice be lower than for the conventional doubler.

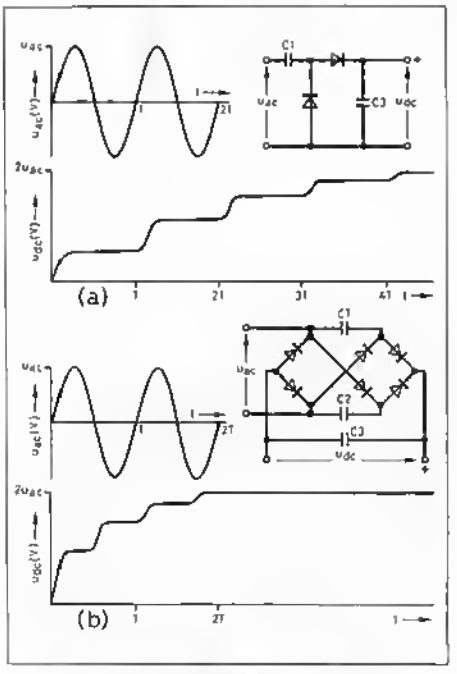


Fig 11. (a) Conventional cascode-type (common terminal) voltage-doubler. (b) Improved arrangement using extra diodes in a bridge-type (symmetrical) arranged as originally described by a Swiss engineer.

CURRENT SENSING LED

Indicator lamps, whether filament or LED, are widely used to indicate when voltage is being applied to an appliance; but very few are arranged to sense whether current is being drawn by the load. A contribution by R Love in the "Circuit & Design Ideas" column of *Electronics Australia* (February 1990, p68) shows a simple way of providing an LED current sensor: **Fig 13.**

Operation is straightforward. When current is being drawn from the device socket, current flows through the silicon diodes, D1 to D3 during the positive half-cycles of the AC mains input, providing a voltage drop of approximately 0.7V per diode. With the three diodes in series this results in a pulsed DC voltage of about 2.1V across the LED through a 10ohm resistor to limit the current through the LED to about 40mA peak on positive cycles half cycles. The fourth diode, D4, shunts the LED during negative half cycles, protecting it from damage while at the same time providing a further current path for the appliance.

Sensitivity of the circuit is determined by the value of R2 which also "prevents operation due to RFI suppressor capacitors or transformer primary windings in some loads." Since the circuit operates at the AC mains potential, all components should be totally enclosed in a suitable, insulated box, to ensure that no contact can be made by the user with mains potentials.

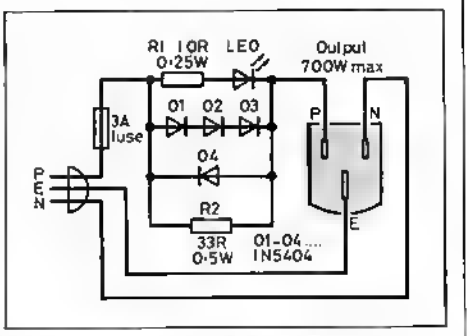


Fig 13. Current-sensing LED indicator for mains-powered appliances.

D/F GROUND-WAVE HF SIGNALS

In the April *TT* brief mention was made of the mobile D/F vehicles used by the German Funkabwehr in their attempts to trace clandestine transmitters that operated during 1940-45 in virtually all of the occupied countries of Europe.

In Germany, the Telefunken Company was encouraged to develop a relatively high performance, battery operated direction finder, type P57N. This was in production from 1935 until 1942. Although described as "portable", the complete unit, when packed in a special box and with canvas cases for the tripod used in the open air, weighed what must have been a back breaking 192lb (87kg)! The P57N **(Fig 12)** had a six-valve battery superhet receiver with three interchangeable coil-assemblies covering 3-6, 6-12 and 10-20MHz. Mounted above the receiver was a 50cm diameter loop and an auxiliary (sense) rod antenna that extended a further one metre above the top of the loop. When set up in the open air, the bearing scale was orientated optically using a "diopter" sighting device similar in principle to those used on prismatic compasses.

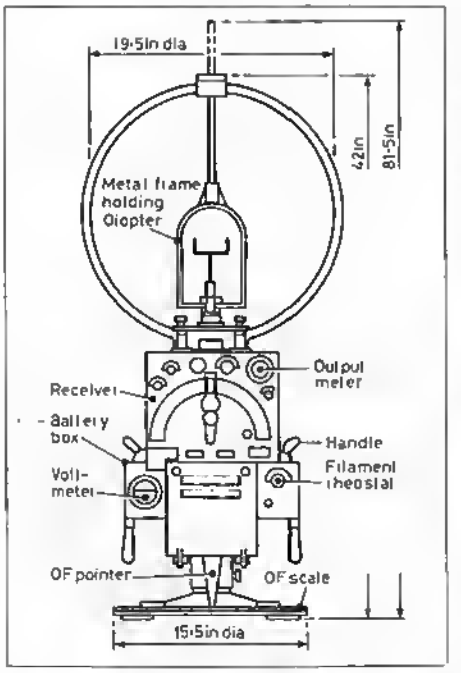


Fig 12. The Telefunken P57N "portable" HF direction-finder as produced from 1935 to 1942. This equipment was widely used in wooden-sided 'delivery' vans by the Funkabwehr in their pursuit of the wartime clandestine radios in occupied countries.

For Funkabwehr operations the P57N was installed in a wooden framed van and could be used stationary or on the move. It was intended for use on ground wave signals at distances up to 30km from the transmitter, giving reasonably accurate bearings when well sited, but was subject to errors when used in towns. The P57N was described in *Wireless Direction Finding* by Major R Keen who was later responsible for engineering the D/F network established by the Radio Security Service (MI8c). Even in 1938, he showed a clear understanding of the difficulty of quickly locating clandestine transmitters, when he wrote: "The response of a closed-loop D/F in a city street to the radiation from a horizontal aerial on a 100ft high building some streets away is likely to display 'aeroplane effect' in its most virulent form with excessive errors. (Aeroplane effect is experienced where an abnormally polarized wave is radiated from the trailing aerial of an aeroplane; when arriving at a D/F station with an angle of incidence less than 90° can produce errors which vary from 0° to 90° depending on the degree of polarization.) The only method of locating such an aerial — after its approximate position has been found by long-range bearing using a D/F that is not susceptible to polarization error — is by averaging of a very large number of bearings using a portable loop. "In the final stages of such a search, the D/F may be made up in suitcase form and taken to the roofs of buildings or to any point from which it seems likely that a bearing can be obtained... Ground-ray D/F in city streets may also be affected by poor signal-to-noise ratio in certain areas, due to the attenuation of the signal in its passage over and through the semi-conducting masses in its path. SNR is, on the other hand, maintained at a high level and for greater distances over the sea, or well clear of the earth's surface."

TEST THESE RIGS 'ON AIR' BEFORE YOU BUY, AT THE

KW 'EMPORIUM'!!

+ KW MAIL/PHONE ORDER SERVICE

Backed by 35 years of supplying the radio amateur — worldwide

Write or phone or jump in your car and come on down to our brand new Communications Centre in Sandling. Feast your eyes on an amazing range of amateur band transceivers and a mouth watering display of accessories. On-air demonstrators, helpful staff and no high pressure selling.

Our fully equipped servicing workshop is at your service backed by solid experience and know how. Mail order is a pleasure.

You are welcome to just browse around or to settle down to planning your new super shack!

How to find us!

We are near to A229. Turn off M20 to Rochester/Chatham. Chatham Road, Sanding runs parallel to Bluebell Hill (A229). Just follow signs to Sandling.

YAESU

FT767GX

£1,599.00

AVAILABLE FROM STOCK NOW!

We also stock — Antennas: Hy-Gain, Buttermut, Cushcraft, 'J'Beam, KW. ATU's — MFJ, TenTec, KW, Kenwood, Yaesu, ICOM. Amp Linear Amplifier, Rotators, Books, Cables, Wire, Scanners, Airband Receivers, Microphones, Morse Keys, Full range of accessories. Baluns, Traps, Headphones, AKD Filters, Antenna Switches, SWR Meters, Dummy Loads, etc.

TEN TEC

OMNI V Transceiver Amateur Bands 10-160M	£1,900.00
PARAGON Transceiver + General Coverage	£1,839.00
CORSAIR II Amateur Bands 10-160M	£1,200.00
ARGOSY II Mobile or Base HF SSB/CW	£589.00
CENTURY 22 CW Transceiver & QRP	£399.76
TITAN Linear Amp 1,500W 10-160M	£2,171.00
HERCULES II Linear Amp 500W 13.8V	£839.00
HERCULES II PSU 100 Amp	£660.00

YAESU

FT767GX Transceiver Gen. Cov. RX	£1,599.00
FT747GX HF Transceiver SSB/FM/AM	£655.00
FT757GX HF Transceiver 10-160M	£969.00
FT212RH Transceiver 2M, 45W	£309.00
FT290R2 Mobile 2M, Multimode	£429.00
FRG8800 Receiver 0.15-30MHz	£649.00
FRG9600M Scanning RX 60-950MHz	£509.00

2M/70CM Mobiles & Handhelds in stock etc

ICOM

IC751A HF Transceiver Gen. Cov. RX	£1,500.00
IC735 HF Transceiver Gen. Cov. RX	£979.00
IC725 HF Transceiver Gen. Cov. RX	£759.00
IC7000 Receiver 25-1000+1025-2000MHz	£989.00
ICR71E Receiver 0.1-30MHz	£855.00

2M/70CM Mobile & Handhelds in stock etc

KENWOOD

TS940S HF Transceiver, Gen Coverage	£1,995.00
TS140S HF Transceiver 10-160	£862.00
TS680S Transceiver 10-160+6M	£985.00
TS440S HF Transceiver Gen. Coverage	£1,138.00
TL922 Linear Amp	£1,495.00
TS790E Allmode Tcvr 2M/70CM + 1296 MHz	£1,495.00

2M/70CM Mobiles & Base, Receivers & Handhelds in stock etc

TS950S HF Transceiver	£2,499.00
TS950SO HF Transceiver	£3,199.00

THE KW POLICY

KW's policy continues as it has done for the past 36 years — to give the customer value for money including the best service available. Every unit is tested in our TEST DEPT before delivery. We do not believe in sending out sealed packages.

Prices correct at time of going to press

Lots more "Goodies" — Trade-in equipment, servicing, EXPERT ADVICE is FREE. Write or phone for brochures.

VISA, ACCESS, RSGB Cards, H.P. All the above prices are correct at the time of going to press and include VAT. Check prices when ordering. Post/Carriage charged at cost. Orders of £200 or over, free delivery within UK.

Open 9am-5pm Tuesday-Friday, 9am-4.30 Saturdays — Write, phone or fax for further details

KW COMMUNICATIONS LTD

Communications Centre, Chatham Road, Sandling, nr Maidstone, Kent ME14 3AY

Tel: 0622-692773 Fax: 0622 764614 Telex: 965834

The G4WIM dual-bander

PART 1

In this three-part series, Tim Forrester, G4WIM, describes a multimode transceiver for 50 and 70MHz which has all the 'bells and whistles' of commercial equipment.

INTRODUCTION

I have always liked operating on 70MHz, especially during contests. During the early 'seventies I took part in a number of contests from the South Lake District area using the callsign G3NJN (the callsign of Blackpool radio club; my own call was G8GIW at that time). The contests provided me with an opportunity to operate on 70MHz and experience at first hand the excellent propagation qualities of what was then the lowest VHF band available.

Many times since operating in those contests I had considered building a multimode radio especially for 70MHz. However, until quite recently I had never been able to justify the time and effort involved in the design of a radio which would only cover one band, was restricted to Class A stations and, due to the relatively low level of activity, might not get the use it would deserve. Ex-PMR equipment was available, but I really wanted all the 'bells and whistles' of a Japanese radio. Of course, there is no such thing as a Kenwood or Icom for amateur 70MHz use (at least to my knowledge!).

Transverters were considered and some designs were investigated and tried, but I was never happy with either the performance or the lack of convenience when changing from band to band.

Thanks to the efforts of the RSGB we were 'given' 50MHz, and Class B stations were to be allowed to operate on both 50 and 70MHz. These two events immediately stirred me into action. It occurred to me that it would be fairly easy to design a radio which would cover both bands, and that the level of activity on 70MHz would no doubt increase. These changes of circumstances made the effort worthwhile and I set about deciding just what this radio was going to do.

After some thought and looking at what commercial radios had to offer, I compiled a list of desirable features and decided that the radio must meet as many of them as possible if I was to be happy with the finished project. The list below was the 'target' specification for the G4WIM dual-bander project.

- Full coverage of both 50 and 70MHz
- Mains or 12V powered
- 10W output (very clean!)
- All-mode (FM, CW, USB, LSB)
- Able to work crossband (simplex)
- 10Hz synthesizer to feel like a VFO radio
- 'Bells and whistles' (scanning, memories etc)
- Very good receiver

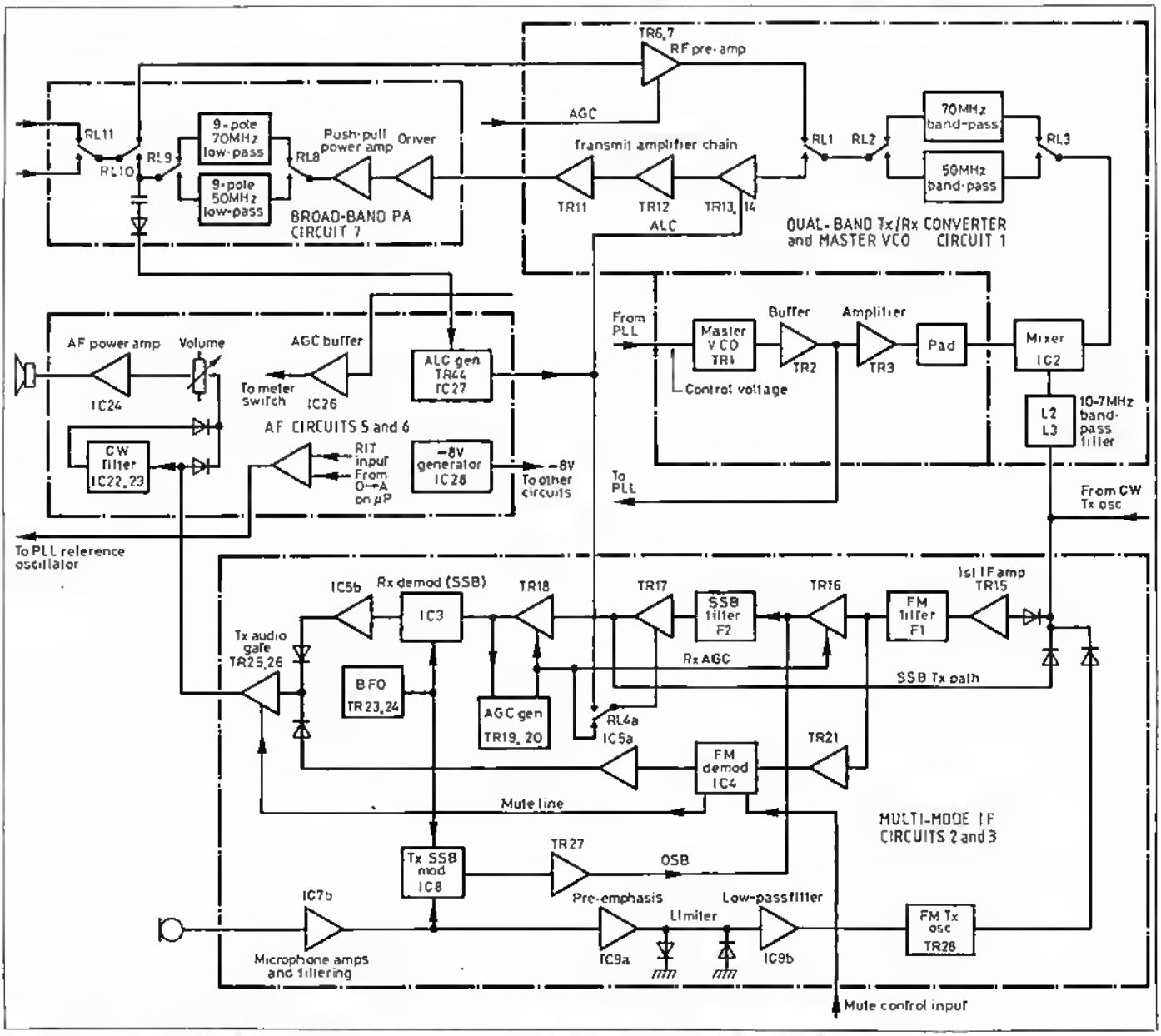


Fig 1. Block diagram showing the dual-band TX/RX converter and master VCO, the multimode IF, the AF circuits and the broadband PA.

- Easy to align (given the complexity of the project)
- Use readily available components
- As reliable as possible
- Look as professional as possible
- Easy to use

Reading the list above seems like a specification for a commercial multiband radio! Indeed, that was just what I hoped to eventually produce, and I am pleased to say all the criteria above were met - in fact several others were added along the way.

Since this radio was completed (mid-1986) and this article written, I have built another transceiver (this time for 1.3GHz) using many of the sub-assemblies used in this project, and have found them to be very repeatable. Also, another fellow amateur is copying the designs for his own use, and therefore I hope there will be no major problems for anyone wishing to build this project.

To give some idea of its complexity, the block diagrams (**Figs 1 and 2**) show the overall operation of the transceiver. There is nothing particularly novel in the method of operation or in the actual circuitry, which I hope should help the design to be readily repeatable.

Do not be deterred by the apparent complexity of this project; just treat it as a number of modestly sized projects which just happen to fit together into a dual-band multimode radio! Certainly, the effort involved is very much worth it, as the feeling of achievement and pride has to be experienced, and it really makes a good talking point 'on the air'.

Front view of the G4WIM dual-bander.

BRIEF OUTLINE OF THE DESIGN

The radio is a single-conversion superheterodyne on SSB and CW, with a first IF of 10.7MHz. On FM receive there is a second IF of 100kHz. The local oscillator runs at circa 60MHz, and is used on the high side for 50MHz and the low side for 70MHz. This approach avoids the need for the LO to cover a 20MHz band. All the RF selectivity on transmit is provided by a pair of 'block' filters tuned to the desired band, and switched in as required. To ensure a good noise figure on receive there is a tuned-input, low-noise RF amplifier using a BF981 MOSFET.

The IF stages use discrete components, rather than the usual Plessey SL600 series of devices. This ensures that the AGC and ALC characteristics can be accurately tailored, and should exhibit no funny squeaks or pops as sometimes can occur with audio-derived systems. Plessey double-balanced modulators are used to both modulate and demodulate on SSB and CW, as they offer very good carrier balance with no adjustment being necessary.

The local oscillator on 60MHz is probably the most complex, as it uses a total of three PLLs to achieve 100Hz resolution, followed by a 10Hz interpolation from a D-to-A converter. A great deal of time and effort was put into designing the LO to have a very low level of phase noise, a very important factor given the overall performance of the radio.

The transmit amplifier chain uses readily available discrete transistors, culminating in a push-pull power amplifier using a pair of BLY83 transistors. The power amplifier is followed by a nine-pole low-pass filter which heavily attenuates any unwanted harmonic energy generated by the PA.

The synthesizer and frequency readout are controlled by a 6805 microprocessor, which also provides all the other 'bells and whistles' associated with commercial radios.

The CW filter is a tunable switched-capacitor filter operating on the audio directly.

In the following sections I will not be describing the operation of each component, as this would

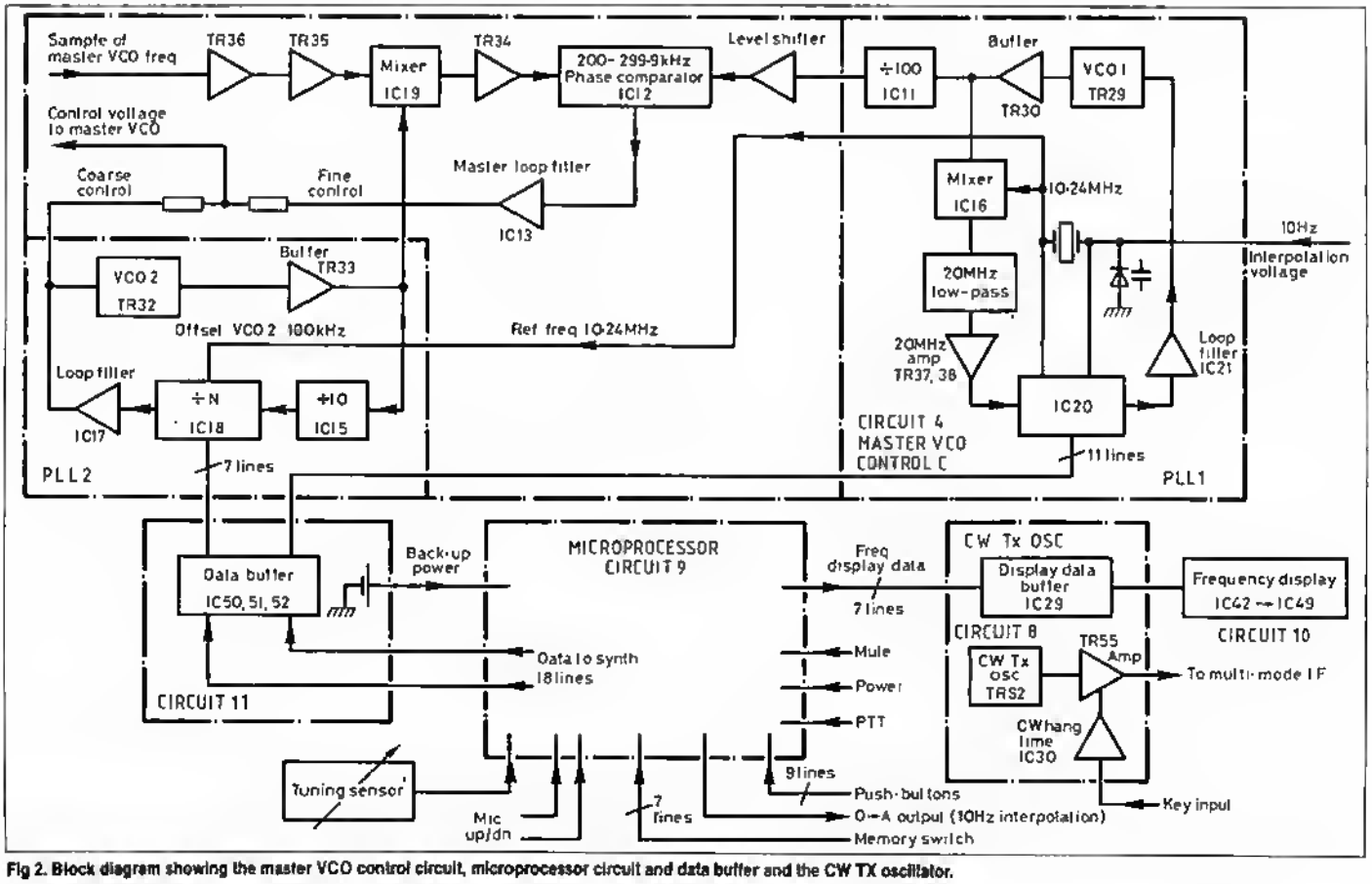


Fig 2. Block diagram showing the master VCO control circuit, microprocessor circuit and data buffer and the CW TX oscillator.

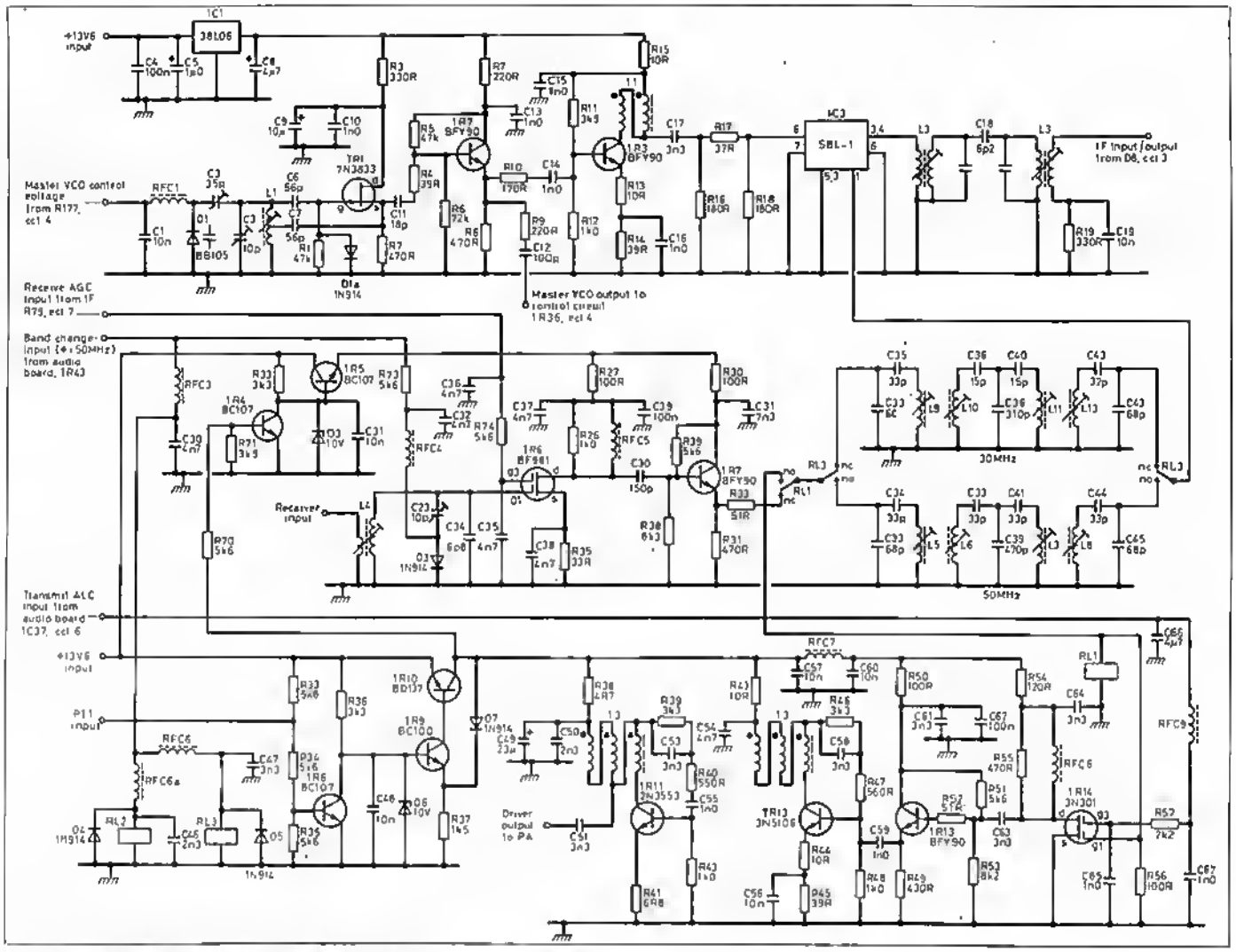


Fig 3. Dual-band TX/RX converter and master VCO (Circuit 1).

take too long and probably be counter-productive. Instead I am going to describe the operation of each part of the circuit down to tC level, and hope this will be a good compromise, bearing in mind its complexity.

DUAL-BAND TRANSMIT/ RECEIVE AND MASTER VCO

This part of the design (Fig 3) is probably the most conventional, in as much as it uses broadband techniques on both the transmit and receive converters, with the bulk of the selectivity being provided by two bandpass filters which are selected as required.

On transmit the incoming IF signal on 10.7MHz is first passed through a 10.7MHz bandpass filter formed by L2 and L3. This is to ensure that any harmonic content of the IF signal is attenuated, thus reducing the possibility of unwanted mixer products being produced and subsequently amplified in the succeeding broadband amplifiers.

IC2 is a standard double-balanced mixer, which up-converts the IF signal to either 70MHz or 50MHz, depending upon the frequency of the master VCO.

If the 50MHz band is selected, then the IF signal is mixed with a local oscillator signal in the range 60.7MHz to 62.69999MHz. This represents coverage from 50 to 51.99999MHz in 10Hz steps. The resolution of the phase-locked master VCO is described later.

Likewise, if the 70MHz band is selected, then the IF signal is mixed with a local oscillator signal in the range 59.3MHz to 59.79999MHz. This again represents coverage from 70 to 70.49999MHz in 10Hz steps.

As can be seen from the above figures, to cover both the 70 and 50MHz bands, the first local oscillator has only to cover 59.3 to 60.7MHz. This is easily accomplished using one VCO formed by TR1, 2 and 3.

If 70 or 50MHz is selected, then the appropriate bandpass filter is selected by RL2 and RL3. Both of these relays are under microprocessor control to enable split-band operation and dual-band scanning functions.

RL1 selects either the RF preamp on receive or the broadband amplifier on transmit.

On receive the incoming signal is routed to TR6, via the aerial selection and aerial changeover relay in the broadband PA unit. The input to TR6 is a tuned circuit comprising L4 and C24, which can be resonated to 70MHz by adjusting L4. If 50MHz is selected then the band change (BC) line goes high and causes D3 to conduct, effectively connecting C23 in parallel with C24. Adjusting C23 then enables the input tuned circuit to be resonated at 50MHz, thus maintaining a good noise figure on both bands.

The drain load of TR6, which sets the gain of the preamp, is defined by R26 and RFC5. This combination of resistance and inductance was carefully chosen to provide approximately 12dB of gain on both bands. To prevent overloading of subsequent stages, automatic gain control (AGC) from the IF is applied to gate 2. TR7 serves as a unity gain buffer to convert the high drain impedance of TR6 down to approximately 50Ω to drive the selected bandpass filter. This filter is necessary to remove the image response of the receiver which would occur 21.4MHz away from the desired frequency.

On transmit the signal from IC2 is immediately filtered in the selected bandpass filter to ensure that the signal is as pure as possible right from the start. After the transmit signal has passed through the filter it is amplified in TR14. This stage is similar to the RF preamp, but this time has automatic level control (ALC) applied to gate 2. The amount of ALC applied is determined by the level of output power and the setting of the RF power control on the front panel. ALC is used in all modes to reduce the possibility of overdriving later stages.

TR12 and TR11 are Class A stages with negative feedback to maintain a very low level of signal distortion, and are both fitted with clip-on heatsinks to dissipate the heat generated in them. TR11 produces only 100mW output, but with third-order intermodulation distortion of -45dB. This figure is quite acceptable for a driver stage in amateur equipment, but could be improved by using even more powerful devices on a higher supply rail with still more negative feedback.

TR5 and D2 form a simple voltage regulator for the RF stages which can be turned off while on transmit. When the radio is on transmit, the PTT line is grounded, which causes TR8 to turn off, thus letting TR9 and TR10 operate as a voltage regulator for the transmit driver stages. As a consequence of the transmit supply appearing, TR4 is forced into conduction, so switching the power off to the RF stages. □

(Part 2 of this article will appear next month)

LOWE ELECTRONICS LTD.

VHF/UHF Tri-band multi-mode

The new Kenwood TS-790E VHF/UHF all mode tri-band transceiver is designed for the dedicated VHF/UHF enthusiast who appreciates real quality and performance. The TS-790E gives all mode operation on 144/430/1296 (option) bands with many enhanced features such as automatic uplink/downlink tracking, dual receive, automatic mode selection, automatic repeater offset, VFO or "channelised" tuning, direct keyboard frequency entry, 59 memory channels (10 channels for separate transmit and receive frequencies), multiple scanning and multiple scan stop modes.
Automatic Lock Tuning (ALT) on 1296 eliminates frequency drift on the incoming signal.
Power output is 45 watts on 144, 40 watts on 430, and 10 watts on 1296 (option module).

★ **High stability VFO.** The dual digital VFOs feature rock stable TCXO (temperature compensated crystal oscillator) circuitry, with frequency stability of +/- 3ppm.

★ **Operates on 13.8 VDC** Perfect for those hill top and DX-peditions.

★ **Mode switches** confirm USB, LSB, CW, or FM selection in morse code.

★ **Dual Watch.** Allows reception of two bands at the same time.

★ **Direct keyboard frequency entry.**

★ **59 multi-function memory channels.** Store frequency, mode, offsets, and "Quick-Step" functions. Ten channels store split frequency information as well.

★ **Memory scroll function.** This allows you to check memory contents without changing the VFO frequency.

★ **Multiple scanning functions.** Memory channel lockout is also provided.

★ **ALT** — Automatic Lock Tuning — on 1296 eliminates drift.

★ **500Hz CW filter built in.**

★ **Packet Radio port.**

★ **Every other desirable feature is provided.** 10dB RF attenuator. Noise Blanker. IF shift for SSB/CW. Selectable AGC. All mode squelch. RF power output control. Speech processor. Dual muting. Frequency lock. RIT. And more. . .

★ **Voice synthesiser option.**

★ **Computer control option.**

Accessories available
★ PS-31 matching power supply. ★ SP-31 external speaker. ★ UT-10 1296 MHz module. ★ IF-232C computer interface. ★ Wide range of matching microphones and headphones.

TS-790E	£1,495
PS-31	£186
SP-31	£63
UT-10	£379
VS-2	£32
IF232C	£69

HEAD OFFICE & MAIL ORDER: Chesterfield Road, Matlock, Derbyshire DE4 5LE
Shops in **GLASGOW** Telephone 041-945 2626, **DARLINGTON** Telephone 0325 486121, **CAMBRIDGE** Telephone 0223 311230,

There is a branch near you

Packet radio from Kantronics — the acknowledged leaders

Packet radio has been expanding quickly in the past two years, and there now exists a national and international data trunking system for automatic forwarding of information. This is open to every radio amateur who has equipped himself with a personal computer and a small box of electrickery called a TNC, which goes between the computer and his amateur radio transceiver. Once in use, personal mail messages can be sent from one radio amateur to another, across the country or around the globe. In addition to this, bulletins and items of general interest can be sent and received, ranging from local club activities, through to AMSAT, RSGB, or ARRL news. This can all be done on an unattended basis, but you can also sit at your mighty Wurlizter and conduct real time QSOs as in RTTY or AMTOR.

In the field of packet radio terminals, Kantronics has always led, and they are constantly pushing forward the advanced ideas which such a medium demands. The beauty of Kantronics terminals is that software upgrades can be incorporated by EPROM changes, and these come complete with all documentation at a fraction of the cost of a new terminal, so you can keep the system right up to date.

The terms used to describe the specification are new to many amateurs, so I won't try to baffle you. Suffice it to say that packet radio is intriguing, exciting, and needn't cost a great deal of money to enjoy. By purchasing Kantronics equipment you are guaranteed to get the best, and it will remain the best for years to come. For more details, just ask for a copy of our "Packet Guide", written by Richard Hillier here at Matlock. If you want to ask questions, Richard will be happy to provide the answers.

All Kantronics units are made to the highest standards, and designed for lasting satisfaction. If you want to "Go Packet", you cannot do better than to choose Kantronics, and join in the world wide enthusiasm for this exciting method of communicating.

The Kantronics range

KPC2 £165 Single port TNC for HF/VHF/UHF, 300 and 1200 baud operation. The ideal starter.

KPC4 £242 Dual port TNC for HF/VHF/UHF 300 and 1200 baud operation. Simultaneous operation on two bands using one computer. Gateway facility between bands.

KPC2400 £224 Single port for HF/VHF/UHF operation at 300, 1200, and 2400 b.p.s. The 2400 b.p.s. is achieved by bi-phase operation thus giving much faster traffic rates between KPC2400s. A PC file transfer programme is supplied free of charge.

KAM £285 The famous Kantronics All Mode TNC. Dual port HF/VHF/UHF operation on two bands using one computer. All mode operation through the HF port includes 300 baud packet, together with AMTOR, ASCII, RTTY, CW, and We-Fax. The VHF/UHF port supports 1200 baud packet, but you can also connect the HF port to a VHF/UHF transceiver and have true all-mode on 2 and 70. Gateway between ports, and superb performance from digital filtering of input tones.

DVR2-2 £199 A truly neat idea in the shape of a specially designed 2 metre FM transceiver for packet radio users. Housed in the standard Kantronics case, the DVR2-2 provides crystal controlled stability on transmit and receive (supplied on 144.65) together with ultra fast switching times for high speed data transfer. 2 watts output, and needing only 12 VDC to operate. You can even plug in a microphone and use it as a talk box.

Telephone 0629 580800 (4 lines) Fax 580020 Telex 377482 All branches are closed all day Monday

S. WALES (BARRY) Telephone 0446 721304, **LONDON** Telephone 081-429 3256 **BOURNEMOUTH** Telephone 0202 577760

Controlled feeder radiation

B. Sykes, G2HCG, shows how an antenna's polar diagram can be improved by controlling the radiation from its feeder.

The use of a balun to feed balanced antennas with coaxial feeder has always been a controversial point, the usual comment being — "it works all right without one, so why should I bother". The two vital uses of a balun are to ensure that the polar diagram of the antenna is as planned, and to prevent interference pick-up on the feeder, or radiation from it.

INTERFERENCE PICK-UP

The advent of the computer in the shack with its high hash level makes the latter point even more important, and here the difference in hash pick up on the feeder is very noticeable when a coaxial antenna feeder is properly terminated with a balun.

POLAR DIAGRAM

Control of the polar diagram of the antenna is not perhaps so noticeable, but it is very important to know the areas of the world covered by the antenna system and perhaps even more important to know the areas rejected by nulls in the polar diagram. A dipole erected reasonably in the clear and properly fed with balun and coaxial feeder to the rig will have little or no pick-up from the ends, and if orientated in a North-South direction will provide a useful reduction in QRM from the powerful southern European HF stations. Omit the balun and those nulls will not be in evidence due to uncontrolled radiation and pick-up from the feeder. Without a balun, one half of the dipole is connected to the outer of the coaxial feeder which will radiate in an uncontrolled manner depending on its length.

It may be, however, that you want to have an omnidirectional radiation pattern or that physical limitations mean the antenna must be erected North-South although you want to work into Europe to the South. Consider the effect of deliberately controlling the feeder radiation and making use of it. This can easily be achieved by simply moving the balun down the feeder from the antenna feedpoint by a quarter wave, allowing radiation from the top part of the feeder and using the balun to stop the radiation (and interference pick-up) from the lower part of the feeder.

I have called this technique *controlled feeder radiation* (CFR). It should be noted that CFR depends on radiation from the outer shield of a coaxial cable which is not applicable to balanced feeders.

BALUN TYPES

There are many different types of balun available (1). The simplest and the one applicable here uses the RF choke principle to stop radiation from the outer of the coaxial feeder by simply winding it into a coil or on to a ferrite ring, weight and size limitations usually dictating the use of the ferrite. Since high impedance with minimum number of turns is required, the use of a high-permeability ferrite core is mandatory. Standard black ferrite cores as used for interference suppression are ideal, and since the balun may need to be suspended from the antenna, the use of small coaxial feeder (URM76) is advantageous in the interests of weight reduction. The standard 4 cm O/D core as supplied by RSGB will take 11 turns of URM76 and should be wound as shown in **Fig 1** in order to reduce self capacitance. A single core will provide sufficient impedance for 28 to 14 MHz and two cores taped together will cover 7 MHz also. If long feeder runs are necessary the small diameter coax need only be used for the balun and radiating portion, a weatherproof coaxial plug and socket being fitted below the balun to connect to a larger feeder with lower losses. If very high RF voltages are expected the balun may be wound onto an antenna rod from an old transistor radio, thus physically separating the input and output.

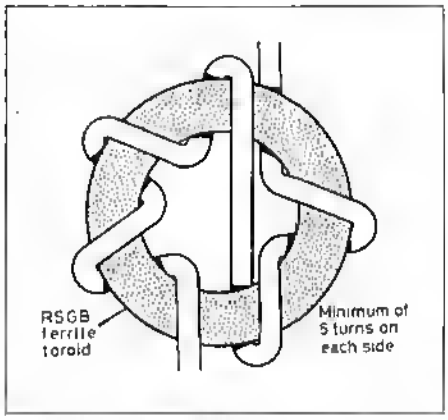


Fig 1. Method of winding choke balun

CHOICE OF CORE

The choke balun operates at high impedance and a relatively low flux in the core, which allows high-permeability materials to be used without fear of core saturation. The transformer balun, usually trifilar wound, operates at low impedance and higher flux densities, often requiring the use of lower permeability ferrites to avoid core saturation and self-resonance effects. The CFR antenna choke core should have a relative permeability of at least 50 at the frequency of use.

IMPEDANCE MATCHING AND CFR LENGTH

A useful advantage of CFR is that the normal 75 ohm impedance of a dipole is reduced to nearer 50 ohms, thus providing a lower VSWR in standard 50 ohm feeder. The physical length of the CFR section will vary with the design of the choke balun. The design shown in **Fig 1** will result in a CFR section length of 0.275 of a wavelength, eg. 19 feet at 14.2MHz, and this, if added to an existing installation will not alter the resonant frequency of the system. If a different choke design is used the CFR section length should be adjusted until the antenna resonant frequency is the same as that of a dipole without the CFR section.

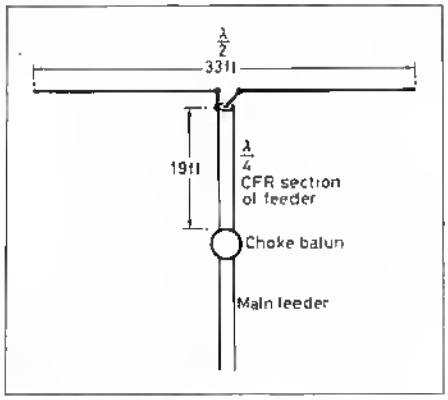


Fig 2. A 14.2MHz CFR half-wave dipole

DIPOLE WITH CFR

Fig 2 shows a dipole fed with coaxial feeder with the balun placed 0.275 of a wavelength below the feed point, thus providing an omnidirectional vertical quarter-wave radiator in addition to the standard figure-of-eight pattern of the dipole. The low-angle vertically polarised radiation is a considerable bonus, being achieved without the need for an expensive and complicated system of ground radials. This application of CFR has been used by the author this year when operating from southern France back to UK on 7MHz, and has proved very effective indeed. Two days of deliberate operation without CFR without announcing the fact resulted in many comments on reduced signal strength.

MULTIBAND CFR

If multiband operation is desired a trap dipole may be used. A typical example has traps for 28, 14 and 7MHz and an overall length for 3.5MHz. The CFR principle can be applied in various ways to this type of antenna, depending on the performance required on the various bands covered.

Placing the choke balun 0.275 wavelength at 28MHz below the feed point will give optimum all-round DX capability on that band with little or no effect on the other bands, retaining for example the QRM-reducing properties of the dipole pattern on 14 and 7MHz.

Placing the choke balun 0.275 wavelength at 14MHz below the feed point will give all round DX coverage on that band with no effect on 3.5 and 7MHz. The CFR section in this case is a half wave on 28MHz and, being high impedance, will not accept power from a low-impedance feed.

Similarly a CFR section having a length of 0.275 wavelength on 7MHz will give all-round DX coverage on that band with no effect on 14, 28, and 3.5MHz. The CFR section is high impedance on 14 and 28MHz.

It is quite feasible to replace the CFR choke balun with a section of feeder wound into a coil and tuned to the required resonant frequency with a capacitor. A number of these resonant traps could be spaced at optimum points along the feeder, thus allowing every possible combination of CFR on the various bands covered.

CFR SPECIALS

The concept of controlled feeder radiation means that it is perfectly feasible to have no apparent connection to the outer of the coaxial feeder. The connection exists nevertheless, namely from the inner to the outer surface of the coaxial shield at the antenna end of the feeder. This leads to considerable simplification in the design of a number of antennas and Fig 3 is perhaps just the beginning of the family of antennas using the CFR principle of making the top section of the feeder into a radiator.

All these antennas when suitably dimensioned have been shown to produce a good match to 50 ohm feeder.

The simplest is **Fig 3a** which consists of a simple quarter-wave end fed element combining with the CFR section to produce a right-angled dipole. The antenna will radiate vertically and horizontally polarised signals, or a mixture of both polarisations dependent on the direction from the antenna.

With the variable polarisations reflected from the ionosphere, the antenna can ba considered fo be virtually omnidirectional. Straightening out this antenna results in a very useful low-impedance end-fed dipole which may be conveniently strung trom the window of an upstairs shack to a suitable point In the garden.

Ftg 3b could variously be described as a "halt square" or a "2/3rd bobtail" and consists ot two vartical radiators, fed in phase with equat power. The polar diagram is figure-of-eight at right angles to the wire with a free space theoretical gain of 3dBd and vertically polarised low-angle radiation. The low angte radiation is particularly usetul for DX work, and the gain achieved in practice on a DX signal is considerably more than the theoreticat tree space 3dBd.

Fig 3c is a halt square wifh an extra quarter-wave horizontal section which results in the addition of horizonfally polarised radiation to the original vertical radiation. DX signals after reflection trom the Ionosphere are of varying polarisation and the ability to handle all polarisations may well be an advantage.

Fig 3d can only be described as a modified "bobtail". The sfandard bobtail is end-fed at the high-impedance point at the end of the centre radiator. This necessitates a resonant feed system, either a link-coupled tuned circuit or a tapped quarter-wave stub. The CFR system is low-impedance feed with the centre radiator consisting of the CFR section of the feeder. Current distribution in fhe three verticals is 50% in the centre and 25% in each ot the verticals. This Is Identical to the standard bobtail and results In a free space theorefical gain of 3dBd with an exceptionally clean figure-ot-eight polar diagram. Comparison tests between this antenna and the two-element version of Fig 3b showed Identical performance on stations within the beam, and fhe excepfionally clean pattern of the three-element was a noticeable

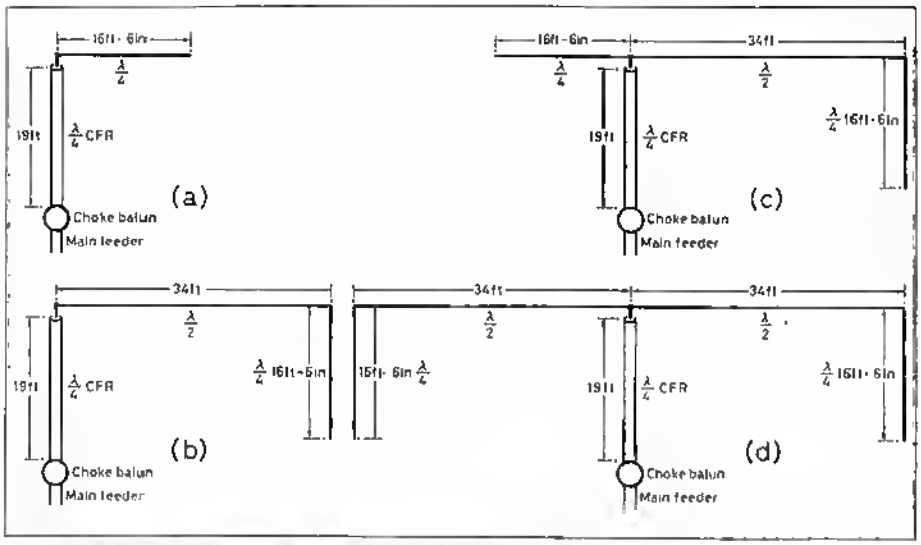


Fig 3. CFR antennas: (a) isotropic; (b) half-square; (c) half-square; (d) bobtail

advantage in reducing QRM but conversely disadvanfageous it the wanted station was out of the main beam. Basically the third element was not worth the extra space required unless the antenna could be accurately orienfated onto the wanted station, when the reduction in QRM from the sharp clean polar diagram could be appreciated.

FEEDER VOLTAGES

It is interesting to consider the voltages on the toeder at the antenna side of the balun. The outside shield ot the coaxial cable is behaving as a low-impedance fed quarter-wave radiator with an end impedance of some 3000ohms, which at a power level ot 50W into that element means some 400V at the end furthest from the feed point. The inside of that same shield is af zero potential, being the outer of a coaxial feed line at an impedance of 50ohms. There is thus a potential difference of 400V across less than 1mm of copper at the choke. A dramatic example ot skin effect in practice.

ACKNOWLEDGEMENT

Initial testing of the CFR principle was conducted at 435MHz on the author's "antenna range" but the final full-size tests with much DX operation were carried out by a near neighbour, Bill Wheeler, G3BFC whose co-operation, patience and encouragement is gratefully acknowledged.

REFERENCE

(1) Ian White G3SEK "Baluns-more than a match" *RadCom* December 1989.

BOOK REVIEWS

MOBILE RADIO SERVICING HANDBOOK

by Roger Belcher, Mike Fitch, David Ogley and Geoff Varrall. Heinemann Newnes, First edition 1989, xvi + 282 pages (240 by 160mm), £25.00 (hard covers), ISBN 0 434 92187 4.

In recent years, the major growth area in the field of professional radiocommunications has been VHF/UHF mobile and personal radiophones, in some cases straining almost to breaking point the capacity of the systems. This expansion has greatly increased the demand for skilled installation and servicing technicians.

As many amateurs have discovered, the servicing of modern mobile transceivers, base stations and portable handhelds calls for both skill and a delicate touch: basic knowledge of circuitry, practical knowledge in coping with fault-tracing and component replacement on crowded printed-circuit boards, most recently with the added problems of surface-mounted technology. While such skills cannot be gained solely from "book-learning", the four authors of this new book — all with years of professional experience in this sector of the industry — have jointly produced a most useful primer that supplements manufacturers' servicing manuals for individual models. It covers the impact of data, cellular radio, national trunking technologies on servicing, diagnosis and repair procedures as well as basic private mobile radio (PMR) services etc.

Although there is nothing in the book specifically concerned with amateur radio (or CB), much of the information would be useful to anyone prepared to undertake the servicing of their crowded and complex units. The emphasis is on information directed at practical servicing in properly equipped workshops. Useful outlines are included on basic circuitry and frequency synthesis etc but not in the depth sought by a designer or home-constructor. Antenna systems are covered but more information might have been included on the care and maintenance of batteries which are only briefly surveyed.

In brief, the book succeeds in meeting the publisher's claim that it 'is an authoritative and practical package of information on the servicing and repair of VHF and UHF mobile radios and base stations, together with the maintenance and support requirements of the overall radio system, including antenna and mast installations'.

CONTENTS:

1, Mobile radio in perspective (10pp); 2, Propegation and frequency utilization (10pp); 3, System choices (5pp); 4, Principles of RF communication (14pp); 5, Practice of RF communication (13pp); 6, Practice of RF communication — transmitter design (7pp); 7, Frequency synthesizer circuit principles (23pp); 8, Principles of RF measurement (25pp); 9, Calibration, test and fault-finding (34pp); 10, Component identification and handling (28pp); 11, Electromagnetic compatibility (EMC) (8pp); 12, Antennas — selection, installation, fault-finding and maintenance (41pp); 13, Typical operator and system problems (4pp); 14, Spectrum efficiency — audio, Selcall, trunking and cellular systems (18pp); 15, Pan-European digital technology (7pp); 16, Data over radio (6pp); Appendices I-VIII (22pp); Index (3pp).

TELECOMMUNICATIONS PRIMER (3RD EDITION),

by G Langley, Pitman, 1990. vi + 182 pages. Soft covers 244 x 184mm, £9.99.

Although this is not a book directed at radio amateurs, it provides a most useful, non-mathematical descriptive introduction to the wide range of modern telecommunications services and their application to information technology (IT): line, radio, broadband, television, ocean cables, satellite systems, fibre optics and with particular emphasis on the growing area of digital services, computer-controlled cellular radio networks, local area networks etc. It should prove most useful to school-leavers and others contemplating a career in telecommunications or to those whose daily work requires an understanding of the services now available. The author has succeeded in providing a readable, up-to-date survey of this expanding field without getting too immersed in detail. The balance of treatment is aimed at the transition from analogue to digital systems; for amateurs, the section on digital fundamentals and applications is a useful introduction. The author, who has worked in professional telecommunications for over 40 years, is able to convey a sound and authoritative view of modern telecommunications, though perhaps a little wobbly on broadcasting and cable television. I was surprised to find my old taskmaster referred to as the ITA some 18 years after it became the IBA, now expected to emerge shortly as the ITC. Again, I do not believe that "nearly all" the CATV systems installed in the USA since 1972 have been provided with a true reverse-channel capability (most of their home-shopping services depend on viewers using the normal telephone service). But these are very minor quibbles in a book that has been extensively revised and up-dated since its first edition in 1983 and now gives an unusually good overview of modern telecommunications.

CONTENTS:

Section A, Basic principles (9pp); B, Some fundamentals (20pp); C, Switching and signalling (17pp); D, Cable, radio and transmission (28pp); E, Maintenance and operation (5pp); F, Television (4pp); G, Digital services (30pp); H, Digital fundamentals (15pp); I, Today and tomorrow (39pp); Index (4pp).

G3VA

YAGI ANTENNA DESIGN

by James L Lawson, W2PV, Publ ARRL. £9.95 (RSGB Members); £11.71 (Non-members).

This book, by the late Jim Lawson, is an edited and extended version of his series of articles in the US magazine *Ham Radio*. This book is required reading for those interested in Yagi antennas, and who isn't?

Starting from fundamental principles, the author develops a powerful CAD approach to Yagi design. Validating his computer model against the NBS experiments of Viezbicke and others, he then uses the program to model a wide range of Yagi designs from 2 to 8 elements on boom lengths of 0.1 to 1.5 wavelength. Of notable interest is the first good discussion of the gain, front to back and boom length relationship. Clearly, we should be describing our antennas in boom length rather than number of elements. The optimisation of front-to-back ratio by the precise adjustment of element spacing is of interest for those who can build antennas to maintain the necessary mechanical tolerances (about 25cm at 28MHz). Loop and quad designs are analysed as a pair of bent close-stacked Yagis and the small gain differences calculated. It would have been of interest to know whether the analysis supports the often stated view that quads out-perform Yagis when close to the ground. The following chapters on the effect of height and the evident performance advantage to be gained from stacking are a 'must' for those who aspire to become 'big guns' or avoid the short skip QRM. Height isn't everything but it certainly helps.

Later chapters go through the steps necessary to turn the theory into practice, including frequency scaling and taper correction. The reviewer automated these calculations on a simple spreadsheet.

The final chapter describes a series of worked examples, ranging from 2 and 3 element Yagis on 7MHz to 3 to 8 elements on 28MHz. All of these designs are monoband. Many designs would seem to be large to European eyes but the strength of the design methodology shows in the strength of the signals. No details of mechanical construction or matching systems are given as these aspects are covered in many other texts. A knowledge of mathematics is not required, but for those who have such knowledge, the book provides added pleasure. This book sets a standard against which others will be judged, just as the antenna designed by its readers will on the air. Buy the book, read it and build yourself a superior Yagi.

G3PJT

Correction to Simple Spectrum Analyser November 1989

The design shows the coil L4 connected directly between pin 8 (Vcc) and pin 6 of the NE602, and the article stated that this was correct. Despite the correct performance of numerous prototypes, discussion with the chip manufacturer has convinced me that I misinterpreted the device data sheet. It is possible that under certain circumstances the oscillator will not function correctly because of this. I suggest that pin 6 of the NE602 be isolated from Vcc by the insertion of a 1n capacitor between pin 6 of the NE602 and the junction of L4/C13. This can be achieved simply by cutting the pcb track next to pin 6 and soldering a small 1n ceramic capacitor on the track side of the board across the gap.

On the Sweep/Video board, R21 may be usefully reduced to 33k, shortening the time the sweep oscillator spends at each end of the sweep.

R P Blackwell, G4PMK

Secret Antennas September 1989

Appendix I should be corrected as follows:

1. Change the second sentence to: "The theoretical radiation resistance of the short radiating element at 7MHz was computed from a simple formula given by Kraus (Ref 4 but p.137. Delete Ref 3), dividing his dipole formula by 2 for a monopole. The result was about 0.7ohms, making the loss resistance approximately 28-0.7 = 27.3ohms".
2. Just below the equation change the sentence to: "In this case the efficiency is about 2.5%, or a loss of 16dB."
3. Delete the short second paragraph.
4. Starting near the middle of the third paragraph, change to: "— radiation resistence R_r of only about 0.0023ohms or little more than 0.3% of the radiation resistance of the compact monopole. So in order for the loop to have the efficiency even of the experimental short monopole it would have to have a loss resistance of about 0.3% of the loss resistance of the monopole, or about 0.08ohms," — and continue with the present text.
5. Add at the very end: "and there is also a ground-wave null at right angles to the plane of the loop."

R Silberstein, W0YBF

ALINCO DR 110 2M 45 Watts!

£269

Receive Option: 140-169MHz.

The new 2 metre mobile transceiver from ALINCO is superb value. Steps of 5, 10, 12.5, 20, 25kHz plus high power make it suitable for a wide number of applications. 14 memory channels and rotary dial control make operation a joy. Improved LCD display makes night operation much easier. The diminutive size (5.5" x 2.5" x 6.75") makes for easy installation in the modern car. Other features include up/down mic., 3 way scanning, 1750Hz tone-burst, reverse input, memory skip, and of course a full mobile mounting kit. Send for colour brochure today!

ALINCO DJ100E

SPECIAL SPRING PRICE

£169 inc VAT!

Lowest Priced
Compact Handheld
2M 3 Watts.
Rx Extendable
10 Memories
Programmed Steps
LCD Display
Ni-Cads and AC charger
Rubber Antenna
DC/DC Converter built in.

ALINCO Dual-Bander 2m & 70cms

Includes Ni-Cad & Charger

Extended RX Option

Revised Price
£319!!

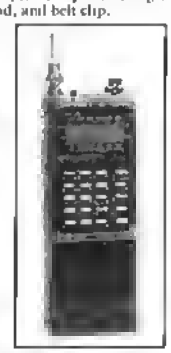
2.5 Watts
Full Duplex
12.5kHz steps
20 Memories
Dual Priority
LCD Display
1750Hz Tone
700mAh Nicad

STILL THE BEST PERFORMERS!

25-1300 MHz* Handheld JUPITER II

£299

Price now includes ni-cads, case, 12V DC power/charger lead, and belt clip.



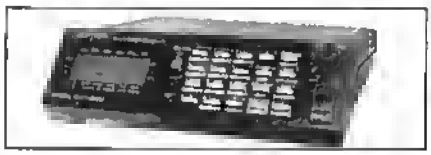
- ★ AM/FM
- ★ Direct up/down tuning
- ★ 5, 10, 12.5, 25, 30 KHz steps
- ★ 100 memories
- ★ 10 programmable bands
- ★ Step change frequency correction
- ★ High speed scan 20 per sec
- ★ Carrier or audio scan
- ★ Battery Saver
- ★ Telescopic antenna (BNC)
- ★ Fast memo load feature
- ★ Individual memory preload
- ★ Uses 4 × AA cells (Jupiter II)
- ★ Size 7" × 2.5" × 1.5"
- ★ 700 MHz first IF
- ★ Proper English Manual
- ★ Superb sensitivity.
- ★ Does not cover 550-800MHz.

No other similar receivers offer the same features at anywhere near the price! And inside the construction is a Joy! Lots of space, nicely laid out boards all linked with quick connect plugs. Not a "Taiwanese Rat's Nest!"

- **Direct up/down control.**
  No need to punch anything into memories. Just enter frequency and use up/down buttons for manual or electronic tuning.
- **AF Scan.**
  No more annoying blank carriers for the receiver to lock on to. Simply tell it to ignore carriers not containing audio and it will!
- **One Button Memo Read.**
  A single button takes you directly into the memory bank. Up/down or scan will quickly move you around or use direct access for a particular channel number.
- **Battery Saver.**
  For long term single channel monitoring this feature will reduce battery consumption by 70%.

25-1300 MHz* Mini-mobile/base JUPITER 6000 inc. P.S.U.

£345



- **Skip Function**
  Whether you want to bypass a single memory channel or an entire bank, this control provides the answer.
- **High Speed Scan.**
  Select high speed scan or search and you will whiz through the range at a healthy 20 steps per second! That means you can scan 100 memories in 5 seconds or 1 MHz of space (25kHz steps) in 2 seconds. It really works!
- **Fast Memo Write.**
  Enables you to quickly write into the memories, no need to select a number, the receiver will use the next empty memory.
- **User Friendly Search Programme.**
  You can search in either direction and change direction at the press of a button. Total agility with a speed to match.
- **Unique Multiband Programme.**
  No less than 10 separate band segments can be stored in the receiver's memory.
- **Total Flexibility.**
  The basis upon which the receiver has been designed. It means you tailor the receiver to do exactly what you want it to do, almost like having a receiver that was designed for your own personal needs. No other receiver can match it, feature for feature and the good news is the cost.

World demand is tremendous. We are selling only small quantities so pick up the phone now and you could be lucky!

FREE CATALOGUE & PRICE LIST! We now have an illustrated catalogue of some interesting products for the radio amateur that we have never had the space to advertise. Also details of new items coming along. Just drop us a first class stamp and we will send you this plus our price list of over 700 items!

MIZUHO "MX" QRP SSB/CW RIGS £189

Now in stock these 2 watt single banders for 80, 40 or 20 metres are real beauties. VXO control (one xtal supplied) gives 25kHz segments on 80 and 40, and 50kHz on 20 metres. Features include noise blanker, S-meter, speaker, morse key, BNC socket. Powered from AA cells or external supply. Packet size 66W x 39H x 142mm deep. As used by GB5BN on Ben Nevis. Amplifiers also in stock. Send for gen

SPECIAL OFFER THIS MONTH

A QRP STATION

Free Offer!

Buy a Mizuho 80, 40 or 20m rig and we will give you a set of ni-cads, 12V DC charging lead, and GP/DJ aerial system completely free of charge! Limited offer so act now!

ALINCO DR510E 2M/70cms Mobile

DUALBINDER DISCOUNT!

At last a dual bander that you can afford! This latest model from ALINCO offers full duplex on 2 metres and 70cms. 45 and 35 Watts output ensure long range contacts. The digital display is superb and there is a proper rotary control for frequency selection. What is more it is very small and will fit most cars. Supplied complete with mic, etc.

IN STOCK NOW!

NOW **£399**

WATERS & STANTON

RETAIL & MAIL ORDER:- 18-20, Main Road, Hockley, Essex SS5 4QS.
Tel: (0702) 206835, 204965

RETAIL ONLY:- 12, North Street, Hornchurch, Essex RM11 1QX.
Tel: (04024) 44765

Visa and Access by telephone. 24hr. Answerphone. Open 6 full days

DEWSBURY ELECTRONICS

G4CLX

NEW PRODUCT No. 2!

THE NEW DEWSBURY ELECTRONICS

SUPA-KEYA

The Dewsbury Electronics Supa-Keya offers the following facilities:

1. *VARIABLE SPEED 2 — 99 WDRDS PER MINUTE*
2. *VARIABLE SIDETONE, PITCH AND VOLUME.*
3. *VARIABLE WEIGHT.*
4. *AUTDMATIC SERIAL NUMBER INSERTIDN.*
5. *8 MESSAGE MEMDRIES (NDN VDLATILE).*
6. *EMBEDDED CDMMANDS IN MESSAGES.*
7. *IAMBIC OPERATION.*
8. *DDT/DASH MEMDRY.*
9. *RELAY DUTPUT.*
10. *PADDLE DR MORSE KEY OPERATION.*

NEW! — Morse check feature, key in an invalid character and Supa-Keya will reject it, thus helping to keep the bands error free! It's true at last, an intelligent keyer.

FULL DETAILS SENT ON RECEIPT OF S.A.E.

PRICE TO BE ANNOUNCED

NEW PRODUCT NO. 1! — THE SUPA-TUTA
Makes learning Morse easier than it's ever been

The self contained unit contains all one needs to learn Morse, and learn it thoroughly. From ABSOLUTE BEGINNER to EXPERT, all can make use of the on-board facilities.

1. Beginners Course, a gentle introduction to Morse Code over 10 lessons, including letters, numbers and accented characters.
2. Training Courses, no less than 90 different training sequences, with answers for checking, plus a further 10 sequences of random letters and figures, but without answers.
3. Ten different messages of 500 characters each, with answers.
4. Random Words, Supa-Tuta has a library of words and abbreviations, no answers for this one!
5. Variable Speed, 2-99 wpm, variable sidetone 500-1250hz, variable inter character spacing, a relay switched output and built in sidetone speaker. Works from 9-14 volts DC at 300ma.

Price £69.95 inc VAT and postage

Send SAE for details

FULL RANGE OF KENWOOD PRODUCTS STOCKED

We are also stockists of DAIWA — POCOM — JRC — TAR — WAVECOM — VIBROPLEX — MICROWAVE MODULES — B.N.O.S.

Dewsbury Electronics, 176 Lower High Street, Stourbridge, West Midlands DY8 1TG

Telephone: Stourbridge (0384) 390063/371228

Fax: (0384) 371228

Instant finance available subject to status. Written details on request.

VISA

Access

GB2SM – the first 35 years

A tribute to the work of Geoff Voller, G3JUL, who has run the station from the beginning.

Probably the most famous UK callsign in the world - GB2SM - is held by the Science Museum in Kensington. Many people have been first attracted to the hobby by seeing the museum's station which has been in operation for 35 years.

RSGB PROPOSAL

The idea of an amateur radio station at the Science Museum came from a discussion between G.R.M. Garratt, G5CS, then Deputy Keeper of the museum's Department of Electrical Engineering and Communications, and the Radio Society of Great Britain. The Society formally proposed to the Museum authorities that an amateur station be set up in line with the policy of having demonstrations of scientific and technical applications whenever possible. The suggestion was accepted with enthusiasm and the station commenced operation on 5 August 1955 under the supervision of Geoff Voller, G3JUL. Geoff first set up the station and has been responsible for it ever since as part of his work with the museum's communications exhibitions.

The callsign GB2SM was the first ever GB2 call and was one of only three permanent special event callsigns at the time.

DEMONSTRATIONS

The Science Museum attracts over a million visitors each year, many of whom come and visit the station. Those who identify themselves as licensed amateurs are invited to sign the visitors' book and most of the world's best-known callsigns appear in this book.

Owing to the complexity of the station, visitors are not usually permitted to operate. This is done by a team of 20 volunteers who man the station on Tuesdays, Wednesdays, Thursdays and Sundays in a rota. GB2SM can be found on the 3rd floor of the Science Museum although the rest of the Communications Exhibition, of which it is part, is now on the ground floor.

On demonstration days, QSOs are set up, usually on phone as this is most easily understandable, and details are displayed on an overhead projector screen. Visitors are still intrigued by being able to talk directly to amateurs all over the world despite the ease with which international phone calls can be made nowadays. Although the station is equipped for VHF and UHF, most contacts are on HF as this has proved to be more attractive to the visitors. Many overseas stations contacted by GB2SM report having visited the museum and its amateur radio exhibit at some time.

One of the questions most commonly asked by visitors is "How much does it cost to get on the air?". RSGB literature is available to those wanting more information and some C.M.Howes QRP kits are on display.

Geoff Voller operating the present day GB2SM. It is now far more comprehensive than most UK amateur stations and uses a console which was specially built 15 years ago by Imhof. ***(Science Museum copyright)***

Geoff Voller, G3JUL, operating GB2SM in 1955. The schoolboys watching were from the Lycee Francais. As a result of encountering amateur radio at the Museum, two became licensed and one went on to become a professor of electronics. The 1955 station, typical of many of this time, comprised a rack mounted transmitter donated by Pye/Labgear, a very early production model of the Labgear LG300 Tx, a GEC BRT 400 and an Eddystone 680 receiver. The aerial was a KW Electronics trap dipole. ***(Science Museum copyright)***

EQUIPMENT

Most of the equipment used by GB2SM has been donated, though some has been bought in recent years. It has been policy to use British equipment but this had to change when no more ht transceivers were made in Britain.

Equipment: Rockwell Collins KM380 HF transceiver, Collins 30L1 Linear Amplifier, Collins 312B-5 control unit, Capco antenna matching unit, Monitor oscilloscope, Yaesu FT980 HF transceiver, Yaesu FT726 VHF/UHF transceiver.

There are also displays of professional teletype, satellite weather pictures, satellite broadcasting and teletext.

Aerials: TH6DXX 4 ele for 14, 21 and 28MHz, Jaybeam 2 el tribander, dipoles for 3.5, 7, and 10MHz, all-band vertical, 430MHz collinear, 14 ele yagi for 144MHz. All are at 120ft above street level.

Tens of thousands of contacts have been made with most countries of the world. Many of the major operating awards, such as DXCC, WAS, WAZ and EDXC have been achieved and are on display. QSL cards go via the bureau.

RESEARCH

Apart from demonstrating the science of amateur radio, the station has been used to further radio research. A beacon was operated on 28MHz from 1966 to 1968 during the trough of the sun spot cycle. The many reports received went to the ITU for analysis. GB2SM was also part of the reporting team for OSCAR 7 in 1974.

Amateur radio as a vital communications link was demonstrated in 1966-7 when the station provided twice weekly the only telephonic link with the island of Tristan da Cunha in the South Atlantic. This was with official agreement and it was used by many government departments and the BBC. During research into heart disease on the island by the Medical Research Council, electrocardiograms were successfully transmitted to GB2SM and thence to the MRC. This was probably the first time that such data were transmitted by HF radio. Instructions for treatment of medical emergencies were periodically transmitted.

GB2SM has enabled the Science Museum to provide public demonstrations of such technological advances as transistor applications, fax, radio teletype, and satellite links. It was one of the first stations in the country to receive signals from Sputnik 1, and to demonstrate its purpose to visitors.

Regular contacts are made with stations in museums and science centres in other countries and many requests have been received for information on how to set up a similar demonstration station.

THE FUTURE

Geoff Voller was awarded the Calcutta Key by the RSGB in 1985 in recognition of his work with GB2SM in furthering international relations via amateur radio. He retired from the staff of the Museum in January but continues to administer GB2SM on a consultancy basis. With the trend towards more self financing for museums, and in view of Geoff's impending retirement, there have been some alarming rumours of GB2SM closing. We are pleased to report that these were quite untrue. Dr E.J.Becklake, Head of the museum's Department of Engineering, wrote to the Society last October "We have no plans to close down GB2SM .... we are proud of GB2SM and hope that it will continue for many years to come".

The Novice Licence – Part 2

This month John Case, GW4HWR, looks at the role of the instructor.

"I THINK I WOULD LIKE TO BE AN INSTRUCTOR"

As the Novice Licence Training Scheme takes shape, there are probably many people asking themselves the above question and wondering if they could cope with the many challenges that will inevitably confront new instructors. If you are an experienced teacher or RAE lecturer, please read on as you may be able to help answer some of the questions that will arise by taking part in one of the short courses to be set up in the very near future.

QUESTIONS TO ASK YOURSELF

"Can I accept the discipline imposed by a rigid 'scheme of work'?"

As explained in last month's article [1], a short course requires a detailed programme of work if the syllabus is to be covered completely in the time available. Each of us likes to do his or her 'own thing' but in this course it is important to resist the many temptations to talk of other things unless the whole group agrees to an extension of course time. Also, in the early stages of running a course, it is most important for instructors to make every effort to follow the training scheme as it is laid out, with no modifications. There will be many opportunities to let your personality shine through in the way in which a subject is presented.

"Am I able to identify with young people and to keep my talks simple without being patronising?"

"Could I advise a student that the course may not be suitable, and do this in a diplomatic way so that the decision does not appear too harsh?"

"If necessary, could I talk to parents/guardians before accepting young students? Could I encourage them to take the maximum interest in the course and perhaps persuade them to join if there is room, and if not, to attend in an observing role?"

"Do I have enough time available?"

Any form of instruction is time consuming so it is important to be sure that you will be able to give all the time needed. Remember that it is not possible to take a group one week and then miss the next. Students may do this but the teacher must not. This will probably mean two hours a week for fifteen weeks!

"Can I make the course fun?

The course must be enjoyable; not just for your students but yourself. This applies to the first and every time you go through it. You will need to be able to learn from your experiences and to search for fresh ways of putting over your ideas. This becomes more important as the subject matter increases in difficulty.

BEFORE YOU START AS AN INSTRUCTOR

You will need to get a copy of the *Training Manual for Instructors* (expected to be available late May) and work completely through the course. Do all of the exercises and build all of the units which the students will be expected to make, looking for student difficulties as you do so. It will be important to 'window dress' your exercises a little by the use of paint or varnish on the wooden baseboards, terminals labelled by means of rub-down transfers where appropriate and excellent soldering whenever it is necessary. These visual aids will be very useful later to show to each new group and to give them something more than the printed instructions to follow.

"IS THERE ANYTHING I CAN DO IN THE MEANTIME?"

Yes, there are several things which a prospective instructor might like to do and which would prove helpful in the future. It has already been suggested that you should work through the course and make up some, or all of the visual aids. The *Training Manual* is written but is not yet generally available. Meanwhile, you could make up the following items.

Test Set No 1. A picture of this appeared in the April edition of *RadCom*. There should be enough information in the diagram to enable the very simple unit to be built.

The medium-wave radio - MF RX. The original design for this appeared in the pilot edition of *DIY Radio*. There has been an updated version which was put out as a handout at the 1988 RSGB National Convention. Copies are still be available from RSGB HQ. A third source is Book 3 of the series *Amateur Radio for Beginners*, available shortly.

The pendulum frame. This is a very useful teaching aid suitable for demonstrating difficult concepts such as resonance, and can be used to show that frequency selective devices can absorb energy from one transmitter but not from another. Similarly, it will demonstrate the ability of one receiver to respond to a transmitter while another will not. It consists of four pendulums, two of the same length and two having lengths different to, but not twice as long or half as long as the first two **(Fig 1)**.

Almost any support will do but it looks much more professional if a simple frame is made up. The vertical posts should be about 18 in. apart, with about 12 in. of free space. Tie a thick piece of thread between the tops of the frame, pulling it up fairly tightly. Next, four identical pendulum bobs are required; in the original, BA nuts and bolts were used. Cut two pieces of thread to the same length - about 12 in., tie one end to one of the bolts and the other to the thread between the posts, making sure that

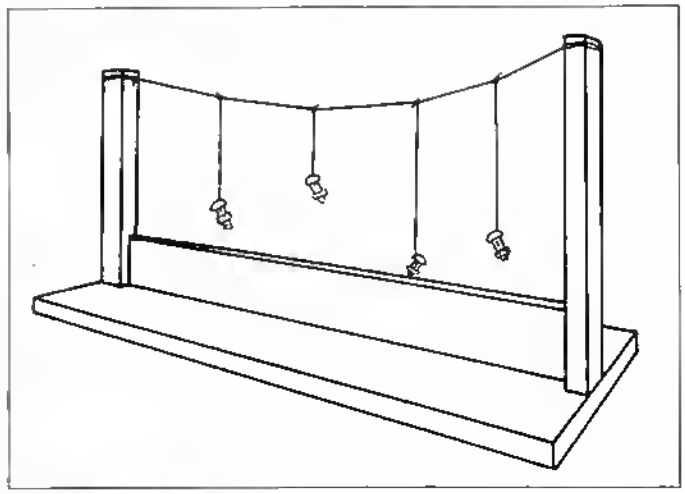
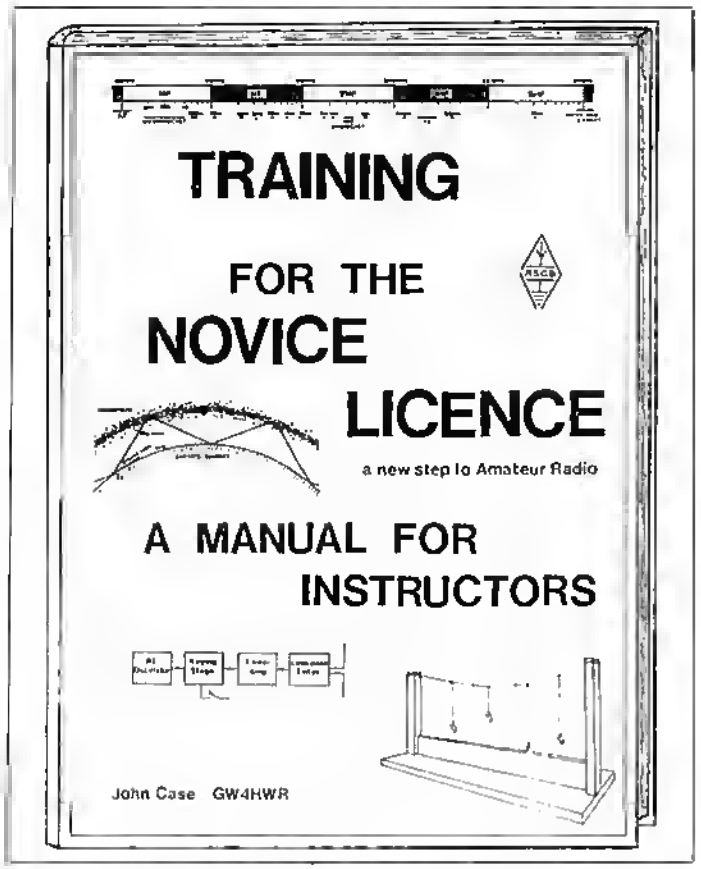


Fig 1. The pendulum frame



the pendulums are the same length. It is most important that the knot between the two pieces of thread is made carefully. Twist the thread two or three times around the horizontal piece and then tie tightly. This is necessary as the horizontal thread must turn when a pendulum is made to swing. Position the pendulums about three inches from the vertical posts. The other two pendulums are fixed in the same way in between the other two as shown.

There are many ways in which this teaching aid can be used. For instance, stop all pendulums and then swing one of the two identical ones so that it moves at right angles to the bar at the bottom of the stand. After a few moments the other pendulum with the same length will start to swing while the other two remain stationary or make some confused movement.

ACCOMMODATION

Many radio clubs already have suitable premises and will be willing to run courses. In that case it would only be necessary to ensure that the necessary equipment is available. Similarly, some Scout and Guide groups may be able to support courses. Where no such facilities exist, it may be worth considering an amateur's shack or workroom, especially as the numbers will be small. If there are any amateurs who would like to help in this way, Hilary Claytonsmith, G4JKS (QTHR), would like to hear from you. The station owner would have to be present whenever the course was in progress to ensure that the equipment was used correctly and carefully.

THE NEXT STEP

If you have decided that you would like to 'have a go', what next?

Watch the pages of *RadCom* inviting prospective instructors to send for an application booklet. This will contain many details relating to the Novice Licence course as well as a questionnaire, the answers to which will be found in the booklet. In addition, there will be an application form.

If your answers are satisfactory you will be asked to attend an interview at some not-too-distant venue. This will be a very informal affair where you will be able to put forward your ideas as well as asking questions about the RSGB scheme. If everything goes well you will become a registered instructor. All this may seem rather involved, but it is important to realise that as an instructor you will be carrying out the continuous assessment which is a very important part of the Licence qualification. It is from this assessment that each student will be able to obtain a course completion certificate. The possession of a certificate will be one of the prerequisites for entrance to the examination.

And don't forget, the course must be FUN!

REFERENCE

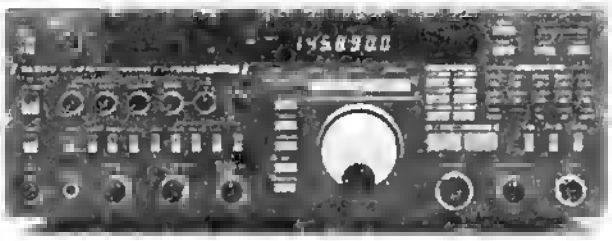
[1] John Case, GW4HWR, "The Novice Licence" *RadComm* March 1990 p16.

RELOCATION SALE...

*We are pleased to announce our move to a new location and need to dispose of a large quantity of stock before moving... **almost everything must go**... and at **prices never before offered**... every item at **near cost**, and many, many items **below** cost at*

DISCOUNTS OF UP TO 50% ..it's a fact!!!

ON HUNDREDS OF ITEMS



- TRANSCEIVERS VHF, UHF AND HF, ● LINEAR AMPLIFIERS ● POWER SUPPLY UNITS
- ANTENNA TUNERS ● ANTENNAS ● CABLES ● PLUGS/SOCKETS ● CABLE ● FILTERS
- AND 100'S OF OTHER ITEMS AT ROCK BOTTOM PRICES

FIRST COME FIRST SERVED

STARTING ***MAY 1ST***

We want to move it... call personally and point out your requirement... we'll price it then you can move it. Full guarantee with almost every item in sale.

Leave us with nothing to move and save £££££££££££'s

*Call by telephone or in person, if the item you require is in stock you can have it... **at a price we guarantee will never be repeated** anywhere... **don't forget** and don't miss it... **starting 1st May until sales stock exhausted***

WE WILL ANNOUNCE OUR NEW ADORESS, TELEPHONE, FAX ANO TELEX NUMBERS IN THE JUNE EOITION OF RAOIO COMMUNICATION... BUT OON'T HANG ABOUT, YOU MAY BE TOO LATE AND PAY MUCH MORE LATER.

AMCOMM AMCOMM AMCOMM

373 Uxbridge Road, London W3 9RN 01 992 5765 Fax: 01 992 5767 Telex: 24263

01 992 5765 01 992 5765 01 992 5765 FOR THE BEST DEAL IN YEARS

MASSIVE QUANTITIES OF SECOND HAND EQUIPMENT MUST BE CLEARED

STEPHENS-JAMES LTD.

47 Warrington Road, Leigh, Lancs WN7 3EA. Telephone (0942) 676790

Turn at the Greyhound Motel on the A580 (East Lancs. Road).

LANCASHIRE & THE NORTH WEST'S LEADING RETAILER IN AMATEUR RADIO

ANTENNA RANGE

Cushcraft
A3 3 Element Tribander Beam £329.00
A3 4 Element Tribander Beam £353.35
10-3CD 3 Element 10m Monobander £115.04
15-3CD 3 Element 15m Monobander £139.70
20-3CD 3 Element 20m Monobander £238.21
AP8 8 Band Vertical 25ft High £164.35
AP5 5 Band Vertical 25ft High £123.36
18 Element 2m Boomer Antenna £106.59
15 Element 2m Boomer Antenna £96.00
Ringo Ranger 2m Antenna £57.00
R5 New 5 Band Vertical Roof Mounting, No Radials £259.00
D3W 10-18.24 MHz Rotary Dipole £159.00

Butternut
HF6VX 6 Band Vertical Antenna £167.00
HF2V 80/40 meter Vertical £142.00

All Butternut accessories available
Hy-Gain Antenna Range available

Jaybeam
TB3MK3 3 Element Tribander £365.00
TB2MK3 2 Element Tribander £246.00
TB1MK3 Rotary Triband dipole £123.00
VR3MK3 Triband Vertical £85.00
DB4 4 & 5 Element Beam £139.00
4Y/6m 6m 4 Element Beam £58.00
5 Element 2m Yagi £22.00
8 Element 2m Yagi £28.00

Antenna Tuning Units
Kenwood AT230 ..... £208.00
MFJ 962B 1.5 kWE Versatuner £258.85
MFJ 949C 300W Versatuner £168.00
MFJ 300 Watt Basic ATU £96.89
MFJ 1601 Random Wire Tuner £48.00
Global ATU000 SWL Antenna Tuner £69.00

Welz
DI30N 25-1300 MHz Discone Antenna £79.00
DCP5 5 band trappos vertical with radial kit £195.00
DCP4 4 band vertical £145.00
Full Range of SWR/Power Meters.
Antenna Traps, Insulators, etc
Full size G5RV Antenna £18.00
Half size G5RV Antenna £16.00
Carriage/Postage at cost

Kenwood Range
TS950S HF Transceiver £3,199.00
TS940s HF Transceive £1,995.00
AT940 Automatic Antenna Tuner £244.88
SP940 Speaker with filters £87.55
TS440S HF Transceiver £1,138.81
AT440 Automatic Antenna tuner £144.82
PS50 20 amp power supply £222.49
TS140S HF Transceiver £862.00
PS430 power supply £175.78
AT250 Automatic Antenna tuning unit £366.00
AT230 Antenna tuning unit £208.67
TL922HF Linear amplifier £1,495.00
MC50 Base station microphone £46.00
MC60A De Luxe desk microphone £88.22
TR751E 2m Multimode Mobile Transceiver £599.00
TM2550E 45 watt 2m Transceiver £485.00
TS680S HF + 6m Transceiver £995.00
TM721E FM Dual Bander £699.00
TH25 2m FM Handheld Transceiver £258.00
TH205E 2m FM Handheld Transceiver £215.00
TH215E 2m Handheld FM Transceiver £252.00
TH405E 70 cm Handheld FM Transceiver £288.00
R5000 General coverage receiver £875.00
VC20VHF Converter 108-174MHz £167.21
R2000 General coverage receiver £595.00
VC10VHF Converter 118-174MHz £161.95
HS5 De Luxe headphones £37.54
LF30A Low Pass Filter £34.00
TM231E 50 Watt FM 2M Mobile £289.00
TM431E 35 Watt FM 70cm mobile £318.00
TM701E Dual Bander 25 Watt £489.00
RZI Wide Band Scanner £465.00

"TEN TEC"
We are pleased to announce we are the northern stockist for the full Ten Tec range
"PARAGON" Transceiver + General Coverage £1,839.00
"CORSAIR" amateur band Transceiver £1,200.00
"ARGOSY" mobile transceiver £589.00
New model "Omni II" Amateur Bands Only Transceiver

Full range of accessories, Psu's — Filter — Microphones.

Receivers
AR2002 Scanning receiver coving 25 550MHz and 800-1300MHz £487.00
R535 Aircraft Bands receiving coving 108-143 and 220-380MHz £249.00
R537 Handheld Aircraft Band Receiver £69.50
Antennas and accessories for above stocked.
HF225 General Coverage Receiver £395.00
AR900 UK Scanner £235.00
WINI08 Handheld Scanning Airband Receiver £175.00
AOR 800E Hand Held Scanning FM-AM Receiver 75-105MHz, 118-136 MHz, 140-174MHz, 407-495MHz, 830-950MHz £199.00
New Model, Jupiter MkII Hand Held Scanner £299.00

Datong Range
AD370 Outdoor Active Antenna £77.62
AD270 Indoor Active Antenna £58.22
D70 Morse Tutor £63.40

MFJ Accessories Range
MFJ1701 6 way Antenna switch £39.00
MFJ300 watt dummy load £33.00
MFJRF Noise Bridge £70.00
MFJ 815 2KW Cross needle SWR/Power meter £75.00

Daiwa
CS201 2 way Ant Switch £14.00
CS4 4 way Ant Switch BNC Sockets £30.39
NS660P 1.8-150MHz + PEP Meter £115.00

Rotators
GS400C £169.00
GS600C £219.00
Daiwa MR 750E £254.00
CDE AR40 ..... £168.72
CD 4511 ..... £219.00
Emotator 1057SX £159.00

Power Supplies
PS120M 3-15V variable 12AMP max £79.50
PS30MX 30AMP PSU £129.50
Stockist for Heil microphones. Mirage amplifiers. Global Publications by RSGB and ARRL.
Post/carriage charged at cost.
Our secondhand list is updated daily.
Please send SAE for this or any information.
Shop Hours 9.30 to 5.00pm Mon-Fri, 4.30pm Sat.

TX-3 RTTY CW ASCII TRANSCEIVE

High performance, low cost. Unbeatable features. BBC, CBM64 tape £20, disc £22. SPECTRUM tape £35, +3disc £37 inc adapter board. VIC20 RTTY CW program tape £20. All need our TIF1 interface or a terminal unit.

GX-2 FAX SSTV TRANSCEIVE

All modes of FAX and colour/mono SSTV. Review In March 90 Amateur Radio. BBC only. Complete system only £99 or £119 with FAX direct printing option.

RX-8 MULTIMODE RECEIVE SYSTEM

FAX to screen and printer, colour SSTV, HF and VHF PACKET, RTTY, AMTOR, CW, ASCII, UoSAT. Every feature. Full disc, printer support. Reviews Oct 89 Ham Radio Today & March 90 Amateur Radio. BBC only. Complete system only £259. DISCOUNT for RX-4 users.

RX-4 RTTY CW SSTV AMTOR RECEIVE

Still a best-seller. BBC, CBM64 tape £25, disc £27. VIC20 tape £25. SPECTRUM tape £40, +3 disc £42 inc adaptor board. All need our TIF1 interface. SPECTRUM software-only version £25. TIF1 INTERFACE for best HF & VHF performance with our software. Kit £20, ready-made & boxed £40. Only with TX-3 or RX-4 software.

APT-1 WEATHER SATELLITE RECEIVE MODULE

Converts satellite signal for display on any FAX system. £59. For use with RX-8, all connections included and price only £39 if ordered at same time as RX-8.
Also MORSE TUTOR £6, LOGBOOK £8, RAE MATHS £9 for BBC, CBM64, VIC20, SPECTRUM. BBC LOCATOR with UK, Europe, World maps £10. All available on disc £2 extra.

Full information available on everything. Please ask.

PRICES INCLUDE VAT AND P&P BY RETURN

technical software

Fron, Upper Llandwrog, Caernarfon LL54 7RF.

Tel: 0286 881886

QRP KITS AT QRP PRICES!

Guaranteed complete to the last nut!

COMPACT 80m CW QRP Tx/Rx

OTR3 Kit — £81.00 Ready Built — £130.00

★ Stable VFO ★ Sidetone ★ Audio Filter ★ Requires 12/14 VDC ★ Very detailed instructions ★ Black steel case ★ Printed panel

COMPANION ANTENNA TUNING UNITS

TU1 Kit — £39.25 Ready Built — £54.50
TU2 Kit — £48.50 Ready Built — £68.50

★ Large dia. coil ★ High grade capacitor ★ Built in balun ★ Circuits to match your antenna ★ Up to 30 Watts of CW ★ TU2 has sensitive QRP/SWR meter

Send SAE for brochure or call Alan G4DVW on 0602 382509

LAKE ELECTRONICS

7 Middleton Close, Nuthall, Nottingham NG16 1BX

(callers by appointment only)

ANTENNES TONNA (F9FT)

THE VHF/UHF ANTENNA SPECIALIST

50MHz		**144/435MHz**		**POWER SPLITTERS**	
5 element	£50.71(a)	9&19 element Oscar	£81.07(a)	2 way 144MHz	£48.36(b)
144MHz		**1250MHz**		4 way 144MHz	£57.53(b)
4 element	£28.39(a)	23 element	£32.29(b)	2 way 435MHz	£45.59(c)
4 element crossed	£37.26(a)	4x23 ele – stacking frame –		4 way 435MHz	£55.36 (c)
9 element fixed	£33.12(a)	power splitter	£175.00(a)	2 way 1250MHz	£36.35(c)
9 element portable	£35.19(a)	**1296MHz**		4 way 1250MHz	£43.36(c)
9 element crossed	£62.10(a)	23 element	£32.29(b)	2 way 1296MHz	£36.35(c)
13 element	£49.08(a)	4x23 ele – stacking frame –		4 way 1296MHz	£43.36(c)
17 element	£66.24(a)	power splitter	£175.00(a)	2 way 2300MHz	£36.35(c)
435MHz		55 element	£49.27(a)	4 way 2300MHz	£43.36(c)
9 element	£30.43(a)	4x55 ele – stacking frame –		**ANDREW HELIAX**	
19 element	£35.84(a)	power splitter	£250.00(a)	LDF4-50A	£5.10m
19 element crossed	£42.44(a)	**2300MHz**		'N' Connectors	£20.00 (c)
21 element 432MHz	£47.61(a)	25 element	£43.47(b)	TELESCOPIC MASTS – STACKING FRAMES – COAXIAL CABLE – ROTATORS ETC	
21 element ATV	£47.61(a)				

All prices include VAT. Please add carriage (a) £5.00 (b) £2.20 (c) £1.20. U.K. MAINLAND ONLY. ACCESS or VISA cardholders telephone your order for immediate dispatch. Callers welcome, but by telephone appointment only, please. Send 50p for our catalogue which contains the full specifications.

RANDAM ELECTRONICS (R) SOLE U.K. DISTRIBUTOR

FREEPOST, ABINGDON, OXON, OX14 1BR. Tel: (0235) 523080 (24Hrs)

ARROW — FOR THE BEST DEAL IN AMATEUR RADIO!!

NEW!! AR1000

SuperScanner
1000 Channel memory
& 15-1300Mhz.

IN AT LAST
Immediate Delivery @ £249

IC-725 STAR BARGAIN

FM/AM Unit Included, Microphone included,
30 Amp P.S.U. included, G5RV Antenna Included

ALL-IN PRICE

£o05.00!!

NEW! IC-24E

ICOM mini dual bander
2M & 70cms FM
DISCOUNT PRICE £349
incl. nicad, charger

TS440S KENWOOD

HF Base Station
with Internal ATU

Please Phone for Price

NEW ICOM IC-R1

Micro-size handheld
scanner 150Khz/
1300 Mhz

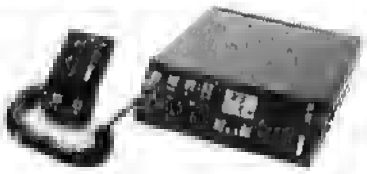
£399

TS140S or TS680S with 6M

Phone for Best Price

NAVICO SUPER SPECIAL OFFER!!

Minimum £50 Trade-in for any working 2 metre or 70cms Japanese Transceiver against the superb AMR1000S at **£299.00**. Take PX to ARROW branch at CHELMSFORD, GLASGOW, OR WIGAN.



FT736R at £1,199
FT470R at £349
FT4700RH at £499

NEC Specials. Some stock left at these prices — subject unsold

TH75E KENWOOD DUAL BANDER

with receive
140/169 & 430/460 Mhz
Nicad & Charger
£398.00

HP100E

NEW HP100E from FAIRMATE, 25/1300 Mhz
1000 channel memory
£279.00

NEW IC-R72 RECEIVER

Genaral coverage
100Khz/30Mhz,
compact size

£599

IC2SET

ICOM 2 metre FM keyboard entry, micro-handy, with inbuilt nicad, wall charger. Extended receive coverage. Included at:

DISCOUNT DEAL £277.00

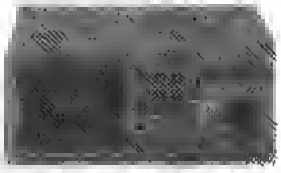
IC4SET

ICOM 70cms FM keyboard entry, micro-handy, inbuilt nicad, wall charger. Included at:

DISCOUNT DEAL £289

Extended receive coverage

ONLY £499!!



The most remarkable Scanner yet. AX700 with Pan Display.

Many major items available with interest free credit at 1grd deposit balance over 9 months (APR zero)

JUPITER SCANNERS!

25-1300 Mhz with exceptional performance (really sensitive at 900 Mhz!)
MTV5000 Handheld £275
MTV6000 Base/Mobile £339
Incl. FREE nicads,
D.C. Lead & case £275
(Super slimline design)

R-7000

ICOM's superb VHF/UHF/ SHF receiver

£895 DISCOUNT PRICE

NEW SHOWROOM IN N. WEST OPEN!!

Greensway Arcade, Gerrard Street,
Ashton-In-Makerfield, Wigan,
Lancs. Tel: 0942 713405

Jim Cook, G6TYB is at your service Mon-Sat

NEW! C528 STANDARD DUAL BANDER

with receive 130/172
350/470 & 890/960 Mhz!

£369

Finance arranged subject to status. APR typical 34.4%. Written quotations on request.
"If you would like data sheets on any item(s) please send a Stamped self-addressed envelope"

COMET ANTENNAS — TOP QUALITY PERFORMANCE

Send SAE for catalogue and NEW SUBSTITUTION CHART

NON RADIAL: Mobile antennas independent of vehicle ground plane
CHL21J 144/432 Mhz, Unity/2.15dB,100W Only 29cms long.....£15.95
CHL23J 144/432 Mhz 2.15dB/3.8dB 100W Only .44 metres £17.95
CHL24J 144/432 Mhz 2.15dB/5 dB 100W 0.8 metres long.....£25.30
CHL250H 144/432 Mhz 3.0dB/5.5dB 200 Watt 0.95 metres long £32.80

2x4 Series + Tripod mobiles and base station antennas
2x4M 144/432 Mhz 4 5/7.2dB 150 watt 1.53 metres.....£37.65

2x4 SERIES & DUAL BANDERS featuring the unique super linear converter system
2x4MAX 144/432 Mhz 8.5dB/11.9dB 200 Watt 5.4 metres "N" G. Fibre.....£125.00
2x4WX 144/432 Mhz 5.5/9.0dB 200W 3.18 metres Glassfibre.....£78.85
2x4SUPER II 144/432 Mhz 6.0/8.4dB 200W 2.43 metres Glassfibre.....£77.35
2x4FX Compact 144/432 Mhz 4.5/7.2dB 200W 1.79 metres.....£55.80

DUPLEX & TRIPLEXERS Zinc alloy diecast
CFXS140 50/144/432 Mhz 800/800/500 Watt PEP 55dB Isolation£38.10
CF413N 432/1296 Mhz 500/200W PEP 55dB Isolation 'N'.....£36.65
CF418 144/432 Mhz 800/500 W PEP 60dB Isolation.....£26.80

OR Series to order only. MONO BANDER MOBILE ANTENNAS
CA285 5/8 wave 3.5dB 300Watt 1.32 Metres Base loaded.....£15.00
CA287C 7/8 wave 5.2dB 200W 1.89 metres double co-phase.....£22.50
CA430TM 3 x 5/8 wave 432 Mhz 6.8dB 150W 1.47 metres.....£28.95

MONOBAND BASE ANTENNAS
ABC21 5/8wave Ground Plane 144 Mhz 3.4dB 200W 1.4 metres.....£24.50
ABC22A 2 x 5/8 wave 144 Mhz 6.5dB 2.87 metres.....£38.00
ABC23 3 x 5/8 wave 144 Mhz 7.8dB 200 W 4.5 metres.....£59.50
ABC71 5/8 wave ground plane 432 Mhz 3.4dB .54 mtrs.....£21.56
ABC72 2 x 5/8 wave GP.432 Mhz 200W 5.8dB 1.07 metres.....£34.85
CA712EF 432 Mhz Twelve x Half wave/ 9.5dB 3.10 metres.....£55.00

HF & 50 MHZ
CHA-5 Vertical with Loaded Radials for 80/40/20/15/10 M 200W SSB 5.29 Metres Features trifilar wound toriodal core.....£219.95
52HB4 4 El.HB9CV Beam 10.4dB for 50 MHz 400W SSB 3.2M.....£67.90
CBL30 HF 1.7 — 30 Mhz Balun 1:1 1kw.....£20.85

CRZ/DIBOONE & HANDHELD ANTENNAS
CRZ12DB A Unique wide band Active antenna 500Hz to 1500 Mhz 1.24 Metres with controller.....£96.30

ARROW RADIO LTD.
5 The Street, Hatfield Peverel, Chelmsford, Essex CM3 2EJ.
Tel: 0245 381626/381673 Fax: 0245 381436
Hours: 9-5 (Closed Thursdays)

GLASGOW SHOWROOMS:
Unit 17, Six Harmony Row, Govan, Glasgow,
Scotland G51 3BA. Tel: 041 445 3060.
Hours 8.30-5.30 Mon-Fri. (Closed Saturday).
AGENT
LEICESTER — DAVE FOSTER Tel: 0533 608189
Latest calls 8.30pm please!

YOUR ORDER CAN BE TELEPHONED WITH CREDIT CARD DETAILS & DESPATCHED IMMEDIATELY!

FREE FINANCE ON MANY MAJOR ITEMS AT RRP. (Ask for details of qualifying items — see examples above).

WOOD & DOUGLAS?

YES — WOOD & DOUGLAS

We're still around and going stronger than ever! Despite the fact that it is nearly 24 months since we last advertised, we still receive a regular flow of orders for our wide range of amateur radio kits.

WHY HIDE OUR LIGHT UNDER A BUSHEL

Because the many amateurs in professional radio communication activities spotted the fact that we were a source of high quality well engineered radio products that could make their busy engineering lives that much simpler. The result is a £1M turnover company providing professional equipment in the OEM, broadcast and security industries and employment for 20 enthusiastic people.

SO WHY ADVERTISE NOW?

To update our faithful followers that we have moved. Not just to any factory, but to a unique, purpose designed headquarters that will give us 10,200 square feet of production space.

WHERE IS IT?

From the address it looks a long way from Youngs Industrial Estate but in fact it is just over the county boundary, less than a mile and a half distance. The phone numbers should also be noted as these have recently changed.

FREE CATALOGUE?

If you would like to know more about W & D, our products, either amateur or professional, then send a large stamped addressed envelope for a catalogue. Our many years of experience in amateur radio, telemetry modules, video links and radio talkback make us a prime source to satisfy your needs.

Wood & Douglas, Lattice House
Baughurst, Basingstoke
Hampshire RG26 5LL
Telephone: (0734) 811444 Fax: (0734) 811567

Access VISA

WOOD & DOUGLAS

VHF/UHF COMMUNICATIONS PRODUCTS

S.E.M.

UNIT R, UNION MILLS, ISLE OF MAN
Telephone: (0624) 851277

S.E.M. TRANZMATCH MKII. The only Aerial Matcher with UNBALANCED and TRUE BALANCED OUTPUTS. 1kW 1.8-30 MHz, £149.50. Built-in EZITUNE (see below), £44.50. Built-in Dummy Load, £9.90. Ex stock.

EZITUNE. Allows you to TUNE UP on receive instead of transmit. FANTASTIC CONVENIENCE. Stops QRM. Boxed unit, £49.50. P.C.B. and fitting instructions to fit in any ATU, £49.50.

FREQUENCY CONVERTERS. V.H.F. to H.F. gives you 118 to 146 MHz on your H.F. receiver, Tune Rx, 2-30MHz, £69.50 ex stock.
H.F. to V.H.F. gives you 100 kHz to 60 MHz on your V.H.F. scanner, £59.50 ex stock. Plug in aerial lead of any receiver. Tuning from 100MHz up.

2 or 6-METRE TRANSMATCH. 1kW, will match anything. G2DYM or G5RV? on VHF. £45.00 ex stock.

DUMMY LOAD. 100 W. THROUGH/LOAD switch, £29.00 ex stock.

VERY WIDE BAND PRE-AMPLIFIERS. 3-500 MHz. Excellent performance. 1.5 dB Noise figure. Bomb proof overload figures. £37.00 or straight through when OFF, £42.00 ex stock.

R.F. NOISE BRIDGE. 1-170 MHz. Very useful for aerial work measures resonant freq. and impedance. £49.50 ex stock.

IAMBIC MORSE KEYER. 8-50 w.p.m. auto squeeze keyer. Ex stock. Ours is the easiest to use. £49.50. First class twin paddle key, £27.00 ex stock.

TWO-METRE LINEAR/PRE-AMP. Sentinel 40: 14× power gain, e.g. 3 W — 40W (ideal FT290 and Handhelds), £105.00. Sentinel 60. 6 x power, e.g. 10 W in, 60 W out. £115.00. Sentinel 100: 10 W in, 100 W out. £145.00. All ex stock.

H.F. ABSORPTION WAVEMETER. 1.5-30 MHz. £39.50 ex stock.

MULTIFILTER. The most versatile audio filter. BANDPASS Hi Pass, Lo Pass and two notches. Frequency and Bandwidth adjustable 2.5 kHz-20 Hz, £88.00 ex stock.

HIGH PASS FILTER/BRAID BREAKER. Cures T.V.I., £7.95 ex stock

CO-AX SWITCH. Three-way + earth position. D.C.-150 MHz, 1kW, £32.00 ex stock.

12 MONTHS COMPLETE GUARANTEE INCLUDING TRANSISTORS

Prices include VAT and delivery. C.W.O. or phone your CREDITCARD NO. Ring or write for further data or catalogue. Orders or information requests can be put on our Ansaphone at cheap rate times. Remember we are as near as your 'phone or post box.

CABLES & CONNECTORS

Westflex 103, low loss air spaced 50 ohm	95p/m (pp 6p/m*)
Popes H100, low loss air spaced 50 ohm	90p/m (pp 6p/m*)
RG213U, (UR67), Mil spec, 50 ohm low loss	70p/m (pp 6p/m*)
UR43, 5mm dia, 50 ohm, single centre	25p/m (pp 3p/m)
UR76, 5mm dia, 50 ohm, stranded centre	25p/m (pp 3p/m)
RG58CU, 5mm dia, 50 ohm, stranded centre	25p/m (pp 3p/m)
RG174U, 2.3mm, 50 ohm, miniature coax	30p/m (pp 2p/m)
UR95, 2.3mm, 50 ohm, mini nylon coax	30p/m (pp 2p/m)
UR111, 2.3mm, 75 ohm PTFE mini coax	40p/m (pp 2p/m)
UR57, 10.3mm, 75 ohm low loss coax	70p/m (pp 6p/m*)
UR70, 6mm dia, 75 ohm transmitting coax	25p/m (pp 3p/m)
Double screened, 75 ohm coax, 8mm dia	40p/m (pp 5p/m)
UHF low loss TV download, 75 ohm	20p/m (pp 3p/m)
75 ohm twin balanced feeder, 400 w PEP	20p/m (pp 3p/m)
75 ohm twin feeder, screened, 6mm dia	40p/m (pp 5p/m)
UR67 50 ohm double screened	60p/m (pp 6p/m)
300 ohm standard ribbon	18p/m (pp 3p/m)
RG62AU, 6mm dia, 95 ohm coax	50p/m (pp 4p/m)
Single core screened cable, 2.3mm dia	12p/m (pp 2p/m)
Two core screened cable, 5mm	25p/m (pp 3p/m)
3 core mains, 5 amp, cable	20p/m (pp 4p/m)
3 core mains, 8 amp, cable	35p/m (pp 5p/m*)
5 core rotator cable, medium duty	30p/m (pp 5p/m)
6 core rotator cable, heavy duty	45p/m (pp 6p/m*)
8 core rotator cable, heavy duty	60p/m (pp 7p/m)
14 SWG HD copper 25p/m	16 SWG HD copper ..... 20p/m (pp 3p/m)
PVC coated AE wire, light duty	8p/m (pp 3p/m)

CONNECTORS

N plug, 10.3mm, Transradio	£2.60	ditto for 5mm	£2.60
N line socket, Transradio	£2.50	only in 10.3mm size	
N4 hole sq chassis socket	£2.60		
BNC plug, Transradio 5mm	£1.20	ditto 10.3mm	£4.60
N SKT to N SKT line adaptor	£3.00	ditto N plug to N plug	£3.50
N socket to BNC plug adtr	£3.00	BNC plug to N socket	£3.00
PL259 plug, Transradio, PTFE/silver	£1.20	(P/P on connectors	75p)

POSTAGE EXTRA
as quoted subject to minimum of 75p or heavy items marked* min postage of £2.50
THIS IS A *SMALL* SELECTION FROM OUR FULL LISTS
30p stamps for complete lists. Trade Prices to Est. Retail Outlets.

W.H. WESTLAKE
WEST PARK, CLAWTON, HOLSWORTHY, DEVON EX22 6ON
PHONE 0409-253758

C.M.HOWES COMMUNICATIONS

MAIL ORDER TO: EYOON, DAVENTRY
NORTHANTS NN11 6PT
TEL: 0327 60178

NEW SSB EXCITER KIT...

The new **HOWES HTX10** is an SSB and CW exciter for the 10 and 15M bands. It has been designed to be the heart of a transceiver for these bands, or as part of a "tunable I.F." for driving transverters.

SSB generation is by the filter method using a double balanced modulator and crystal filter. The onboard microphone amplifier is designed for low impedance microphones, and the key input accepts straight or electronic keyers. Relay switched band filters, PTT switching, and ALC input facilities are amongst the technical features provided.

Perhaps the most important feature of the HTX10 is that it is a HOWES KIT. This means that the module has been designed specifically for home construction, with ease of building and set-up in mind. There is also an expanding range of interlinking, companion kits for you to use with the HTX10 if you wish. The **DXR10 receiver** and **VF10 VFO Kits** are available now, and there are matching transverter and PA kits under development. If you fancy the challenge of building something a little more "upmarket" than a simple QRP CW rig, then the HTX10 may well prove of interest.

HTX10 kit: £49.90 **Assembled PCB: £74.90**

VF10 DUAL BAND VFO TO SUIT HTX10

The new VF10 has been designed to provide the VFO input to the HTX10 for operation on 10 and 15M. It has all the features normally found on our well regarded, stable VFOs: IRT (clarifier), FET oscillators, voltage regulation and separate buffered outputs for TX and RX use. Used with a 50pF tuning capacitor, the VF10 will tune the HTX10 over 28 to 28.6 and 21 to 21.45 MHz. A larger capacitor can be used for wider tuning range on 10M if you wish. Circuitry includes 16 transistors (5 FETs) and 14 diodes.

VF10 Kit: £18.50 **Assembled PCB: £28.80**

SOME INTERLINKING HOWES MODULES

	KIT	ASSEMBLED PCB
AP3 Automatic Speech Processor	£15.90	£22.80
CM2 Quality Mic with "VOGAD"	£11.90	£15.90
CTU30 All band 160 to 6M ATU 30W	£27.90	£33.90
DXR10 10, 12 & 15M SSB/CW Receiver	£24.90	£36.90
OCS2 "S meter" to suit receivor	£7.90	£11.90
CSL4 Narrow SSB & CW filter for RX	£9.90	£15.90
DFD5 Digital Frequency Counter	£39.90	£59.90
ST2 Side-tone oscillator	£8.80	£13.50
SWB30 SWR/Power indicator/load	£12.50	£17.30

Please add £1.00 P&P to your total order value.

All **HOWES KITS** include full, clear instructions, a good quality PCB with screen printed parts locations, and all board mounted components (yes, this does include the crystal filter on the HTX10!). Delivery is normally within 7 days. Credit card sales and technical help are available by phone during office hours, but please send an SAE for a copy of our catalogue or data sheets on specific products.

73 from Dave G4KOH, Technical Manager.

GAREX THE SCANNER SPECIALISTS

POPULAR SCANNERS

AOR900UK inc UHF Airband	£199
BJ200 MkIII wide coverage	£199
Jupiter II superwide coverage	£299
Uniden 200XL inc 900MHz	£249
Uniden 50XL FM handy	£99

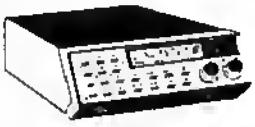
AOR 2002

- Covers: 25-550MHz, 800MHz-1.3GHz
- AM & NFM & WFM on all bands
- Computer interface socket
- 20 memories
- Compact size
- 12V dc operation
- Up/down step control knob

£487

REVCO RS-3000

THE COMPACT SCANNER



- Size only 6"×2"×8"
- Covers: 26-32MHz, 60-90MHz, 118-180MHz, 380-512MHz
- AM & FM all bands
- Liquid crystal display
- 50 memories
- Scan, search, priority

£225

AOR 800E

THE SMALLER HANDY-SCANNER

- Covers: 75-106MHz, 118-175MHz, 406-496MHz, 830-950MHz
- AM & NFM programmable on all bands
- Full scan & search functions are available
- 20 memories
- Measures only 2.5"×5.5"×2"
- Nicads, charger & BNC whip antenna included in the price

£169.50

JIL SX-200N

THE SUPERIOR SCANNER

- The choice of the professionals
- Proven reliability
- Covers: 26-88MHz, 108-180MHz, 380-514MHz
- AM & NFM on all bands
- Positive action keyboard
- 16 memories
- 12V dc & 240V ac

£325

WIDE BAND ANTENNAS & AMPLIFIERS

REVCONE Discone British made renowned throughout the world for performance and quality of construction, optional vertical whip feature for experimenters. Basic coverage 50-500MHz.

Basic REVCONE SO239 socket excellent value at	£35.95
REVCONE with N-type socket improved UHF performance	£37.95
Add-on vertical whips from REVCO's standard mobile range.	
REVCO RADAC best-of-dipoles with guaranteed Transmit capability	£45.00
PA3 inline masthead model with special mains psu 20-1,000MHz min 13dB gain PL/SO connectors	£49.95
PA3/N masthead with N-type connectors	£53.45
PA3I instrument or back-of-set version for 12v DC operation.	
BNC sockets (SO239 option)	£35.50
PA31/N as above but N-type sockets	£38.95

GAREX ELECTRONICS

HARROW HOUSE, AKEMAN STREET, TRING, HERTS HP23 6AA.
Phone 0296 668684 or 044 282 8560. Callers by appointment only.

MAIN DISTRIBUTOR OF REVCO PRODUCTS. PRICES INCLUDE UK P&P and 15% VAT. Ask for details of our interest free credit.

Extensive range of PYE radiotelephone spares — S.A.E. for list.

Ask for our secondhand scanner bargain list.

Your Very Own Local RSGB Liaison Officer

Every member has a local liaison officer to turn to for advice on amateur radio matters. Details are now printed on your membership card. When you receive your membership card please make a note in your diary for future reference.

If you have a query about:

- **How do I get started in amateur radio?**
- **Where is my nearest amateur radio club?**
- **Where can I find an RAE course?**
- **Who is the local expert on . . .?**
- **Who in RSGB do I contact about . . .?**

Then please contact your local RLO.

He or she will know the answer to your question or who best to contact for the specialist answer. Remember, your RLO may well be very local to you, and being a volunteer may be contacted during the early evening when telephone calls are cheap.

AVON (Zone O) - Shaun O'Sullivan, G8VPG. Tel: 0225 873098.
BEDFORDSHIRE (Zone B) - John S Smith, G4KJJ. Tel: 0480 68330.
BERKSHIRE (Zone D) - Dave Chislett, G4XDU. Tel: 0628 25720.
BORDERS (Zone G) - Ian Wilson, GM4UPX. Tel: 0835 62656.
BUCKINGHAMSHIRE (Zone D) - Ron Ray, G3NCL. Tel: 0494 776420.
CAMBRIDGESHIRE (Zone B) - see Bedfordshire.
CENTRAL (Zone G) - B J Waddell, GM4XQJ.
CHESHIRE (Zone A) - G R Morris, GW1ATZ. Tel: 0244 818252.
CLEVELAND (Zone A) - Malcolm Brass, G4YMB. Tel: 0287 38119.
CLWYD (Zone E) - Peter Higgs, GW4IGF. Tel: 0244 570212.
CORNWALL & ISLES OF SCILLY (Zone D) - Bert Hammett, G3VWK. Tel: 0726 882758.
CO ANTRIM (Zone F) - **Belfast:** Gordon Curry, GI6ATZ. Tel: 0232 795307. **Co Antrim:** Refer to Zone F Council Member.
CO ARMAGH (Zone F) - Danny Campbell, GI4NKD. Tel: 0762 42620.
CO DOWN (Zone F) - see Co Armagh or Co Antrim (Belfast).
CO DURHAM (Zone A) - see Cleveland.
CO FERMANAGH (Zone F) - see Co Armagh.
CO LONDONDERRY (Zone F) - V Mitchell, GI4ONL. Tel: 0504 48295.
CO TYRONE (Zone F) - see Co Londonderry.
CUMBRIA (Zone A) - M Gibbings, G3FDW. Tel: 04484 2435.
DERBYSHIRE (Zone B) - refer to Zonal Council Member.
DEVON (Zone D) - Dave Livsey, G4BOH. Tel: 0392 79876.
DORSET (Zone D) - **North:** Ken Walkin, G3AIK. Tel: 0935 825266. **South:** Ken Powell, G1NCG. Tel: 0202 666050.
DUMFRIES & GALLOWAY (Zone G) - refer to Zonal Council Member.
DYFED (Zone E) - W M David, GW4WMD. Tel: 06467 685.
EAST SUSSEX (Zone C) - Jim R Harris, G4DRV.
ESSEX (Zone C) - refer to Zonal Council Member.
FIFE (Zone G) - Martin Hobson, GM8KPH. Tel: 0796 2140.
GLOUCESTERSHIRE (Zone D) - F W Mills, G4XXA. Tel: 0242 579094.
GRAMPIAN (Zone G) - Allan Duncan, GM4ZUK. Tel: 0224 861550.
GREATER LONDON (Zone C) - **North:** Roy Charlesworth, G4UNL. Tel: 01 804 5643. **South:** Robin Sykes, G3NFV. Tel: 0372 372587.
GREATER MANCHESTER (Zone A) - Bob Catlow, G4ARP. Tel: 061 652 8617.
GUERNSEY & DEPENDENCIES (Zone D) - Steven Gibbs, GU3MBS. Tel: 0481 57605.
GWENT (Zone E) - Peter Dombrowski, GW1NYO. Tel: 0495 246359.
GWYNEDD (Zone E) - refer to Zonal Council Member.
HAMPSHIRE (Zone D) - Trevor Emery, G3KWU. Tel: 0703 693673.
HEREFORD & WORCESTER (Zone B) - Chris Pettitt, G0EYO. Tel: 021 430 7267.
HERTFORDSHIRE (Zone C) - see Greater London North.
HIGHLAND (Zone G) - refer to Zonal Council Member.
HUMBERSIDE (North Humberside: Zone A, South Humberside: Zone B): refer to Zonal Council Member.
ISLE OF MAN (Zone A) - Colin Mathewman, GD4FWO. Tel: 0624 22295.
ISLE OF WIGHT (Zone D) - Doug Byrne, G3KPO. Tel: 0983 67665.
JERSEY (Zone D) - S W Smith, GJ0JSY.
KENT (Zone C) - D Axford, G4LHU. Tel: 0634 575778.
LANCASHIRE (Zone A) - refer to Zonal Council Member.
LEICESTERSHIRE (Zone B) - D Gwynne Harries, G4WYN. Tel: 0530 417307.
LINCOLNSHIRE (Zone B) - see Humberside.
LOTHIAN (Zone G) - Tom WG Menzies, GM1GEO. Tel: 031 447 3219.
MERSEYSIDE (Zone A) - M Chappell, G0GQX. Tel: 051 427 3499.
MID GLAMORGAN (Zone E) - Clive Trotman, GW4YKL.
NORFOLK (Zone C) - William Higgins, G3PNR. Tel: 0603 629150.
NORTHAMPTONSHIRE (Zone B) - Ian Hopwood, G0EDT. Tel: 0789 68863.
NORTHUMBERLAND (Zone A) - see Cumbria.
NORTH YORKSHIRE (Zone A) - **NE of River Ouse:** Bob Wilkinson, G4YKO. Tel: 0723 352823. **SW of River Ouse:** Gareth Foster, G1DRG. Tel: 0904 421392.
NOTTINGHAMSHIRE (Zone B) - M J Leeson, G8GNN.
ORKNEY (Zone G) - A W Wright, GM3IBU.
OXFORDSHIRE (Zone D) - Neill Taylor, G4HLX. Tel: 036 77 503.
POWYS (Zone E) - E Paul Essery, GW3KFE. Tel: 0686 28958.
SHETLAND (Zone G) - Pete C Weller, GM3XOQ. Tel: 09502 354.
SHROPSHIRE (Zone B) - C Hughes, G0DQW.
SOMERSET (Zone D) - **North:** refer to Zonal Council Member. **South:** Ken Watkin, G3AIK. Tel: 0935 825266.
SOUTH GLAMORGAN (Zone E) - see Mid Glamorgan.
SOUTH YORKSHIRE (Zone A) - refer to Zonal Council Member.
STAFFORDSHIRE (Zone B) - see Shropshire.
STRATHCLYDE (Zone G) - Bob Low, GM0ECU. Tel: 0563 35738.
SUFFOLK (Zone C) - see Norfolk.
SURREY (Zone C) - see Greater London (South).
TAYSIDE (Zone G) - see Fife.
TYNE & WEAR (Zone A) - Eamonn W F Malone, G4MRT. Tel: 091 281 0994.
WARWICKSHIRE (Zone B) - see Northamptonshire.
WESTERN ISLES (Zone G) - see Highland.
WEST GLAMORGAN (Zone E) - see Dyfed.
WEST MIDLANDS (Zone B) - refer to Zonal Council Member.
WEST SUSSEX (Zone C) - KFH Newland, G7AIE. Tel: 0444 247325.
WEST YORKSHIRE (Zone A) - Refer to Zonal Council Member
WILTSHIRE (Zone D) - Ron Freeman, G4XTH. Tel: 0249 650800.

ZONAL COUNCIL MEMBERS: see page 4.

RSGB COMMITTEES AND GROUPS
ARDF WORKING GROUP: Chairman - Robin Pearce-Boby, G3JLE
EMC COMMITTEE: Chairman - Bob Peace, G8SOZ
EXHIBITION & RALLY COMMITTEE: Chairman - Norman Miller, G3MVV
FINANCE & STAFF COMMITTEE: Chairman - Willie McClintock, G3VPK
HF COMMITTEE: Chairman - Martin Atherton, G3ZAY
HF CONTESTS COMMITTEE: Chairman - Ron Glaisher, G6LX
IARU COMMITTEE: Chairman - R J (Tim) Hughes, G3GVV
LICENSING ADVISORY COMMITTEE: Chairman - John Bazley, G3HCT
MEMBERSHIP LIAISON COMMITTEE: Chairman: Geoff Smith, G4AJJ
MICROWAVE COMMITTEE: Chairman - Mike Dixon, G3PFR
PACKET WORKING GROUP: Chairman - Ian Suart, GM4AUP
PLANNING ADVISORY COMMITTEE: Chairman - Harold Fenton, G8GG
PROPAGATION STUDIES COMMITTEE: Chairman - Ray Flavell, G3LTP
RAYNET COMMITTEE: Chairman - Philip Howarth, G3YAC
REPEATER MANAGEMENT GROUP: Chairman - Geoff Dover, G4AFJ
TECHNICAL & PUBLICATIONS ADVISORY COMMITTEE: Chairman - Peter Chadwick, G3RZP
TRAINING & EDUCATION ADVISORY WORKING GROUP: Chairman - John Case, GW4HWR
VHF COMMITTEE: Chairman - Peter Burden, G3UBX
VHF CONTESTS COMMITTEE: Chairman - Bryn Llewellyn, G4DEZ ■

NEIL LASHER, G6HIU
40 Farm Road, Edgware, Middx
HA89LT

3.5 MHz Licences Released

At last the DTI has cleared on an experimental basis all but one of the 3.5MHz mailbox applications. These are intended primarily for links within the UK and with near Europe. If you are active on this band please send any reports to me so that I can report how these stations integrate into the network.

At the same time, the DTI released another mailbox licence, GB7GHU, located in Perivale, Middx, on 29.250MHz. I can report that in its first few days of operation many European stations had connected to read the British messages.

News from Japan.

JARL News the Japan Amateur Radio League news-sheet has a full report this month on the new Packet satellite JAS-1b/Fuji-Oscar-20. This was launched successfully on February 7th from the Tanegashima Space Centre. Along with the report is a full instruction sheet on how to use it. As this satellite has a fully working mailbox on board I have reproduced the article below.

***JAS-1b** has two transponders, one for analogue communication by CW and SSB phone, the other for digital communication by packet mailbox.*

Necessary equipment

1. FM transmitter on the 144 MHz band with an output of 10 Watts for the uplink, which sends digital signal from a modem in F2 modulation.

2. SSB receiver on 435 MHz band for the downlink, which delivers down-converted signal in Bi-phased PSK to the modem. It is preferable for the receiving frequency to be controlled by external controlling signal from a demodulator.

3. Antenna: For uplink, gain requires some 10 dbi, and for downlink, 10-15 dbi it is preferable to have a dual axis rotator for the antenna so as to trace JAS-1b.

4. Modem for demodulation of PSK signals.(G3RUH PSK modem will suffice) set at 1200 baud.

5. TNC

6. Terminal with RS-232C serial port and emulation software.

Setting up your TNC

Set AX25L2V2 to ON. AX.25 must be level 2, otherwise you will not be able to connect to JAS-1b.

Set FRACK which is the waiting time for an ACK signal to 6 or higher. Other time constants are the same as for normal packet operation. When there are many stations using JAS-1b it may be advisable to increase FRACK.

Set MAXframe = 2 and PACLen = 128. PACLen should not exceed 200 under any circumstances.

You are now ready to try to connect to JAS-1b. The downlink frequency is 435.910MHz, while the uplink is any of the following four frequencies. 145.85/145.87/145.89/145.91 MHz.

The callsign of the satellite is 8J1JBS and when connected you will be prompted with the following sign on message.

****CONNECTED to 8J1JBS*
FO-20/JAS-1b Mail box Ver.1.11
commands (B/F/H/M/R/U/W)
Use H command for Help
JAS>

*The available **command list.***
B: List file headers addressed to All
F: List latest 15 file headers
F: List latest 50 file headers*
F(d):List file headers posted on day (d)
H: Show this help list
K(n):Kill file numbered (n)
M: List file headers addressed to current user
R(n):Read file numbered (n)
U: List current user(s)+SSID
W: Write a file

A few short notes.

Mail can only be killed by either sender or addressee. No mail is personal so everyone can read every message. Only ASCII codes can be used apart from Ctrl Z to end a message. No digipeat function is available nor does it respond to a frame being digipeated. There is no command to log off. It must be disconnected by a TNC command.

Thanks to JARL for the above information, if you manage to work it please write and let me know.

Deviation and Packet.

I mentioned a couple of months ago that deviation settings should be checked and kept to a maximum of 2.5kHz. It has been pointed out by many readers that this seems an impossible task without the use of very expensive equipment not readily available to the average amateur. To make life a bit easier the Scottish Digital Group, MacPac, have published in their magazine an article entitled Simple Deviation Setting, part of which I have reproduced.

The precise adjustment of FM deviation for packet use is far more critical than for voice operation. Manufacturers of "black box" transceivers usually design them to work with their own specified equipment,ie microphones.

It is well worth the effort to get packet deviation right because any packet that is not received correctly gets repeated, again and again. This increases congestion and slows down your throughput. The general rule of thumb for packet on 25kHz channel spacing as we have at present, is that the peak deviation should be half that of the system deviation. ie 2.5 kHz with the wrong levels these are the results you can expect.

Very low deviation: No modulation at all, or only one tone is sent.
Low deviation: More noise than signal.
Correct deviation: It works!!
High deviation: Frequency tolerance critical; noise operated Rx squelch circuits "dump" your signal.
Very high deviation: TX level clippers operate or wide signal is transmitted across adjacent channels.

Although very expensive test equipment makes the setting of deviation straightforward, it can be adjusted using a receiver and an oscilloscope.

Connect the oscilloscope to display the audio output of the monitor receiver, then tune it to a local repeater output frequency. Adjust the 'scope so that a full screen display is produced by the repeater output when it is receiving a strong input signal. Leaving the oscilloscope settings, retune the receiver to your packet frequency.

Connect your packet transmitter to a dummy load and put your TNC into CALIBRATE mode so that it transmits a continuous sine wave that can be observed on the oscilloscope.(you may have to remove the jumper in the TNC that controls the watchdog timer, remember to replace it afterwards)

Now adjust the TNC drive level and transmitter audio level control (if it has one) until the oscilloscope displays a maximum of half the output you observed from the voice repeater on either TNC tone.

If the tones show up with significantly different amplitudes it probably indicates that you need a simple RC filter in the transmitter audio input circuit or the monitor has a biased response. Try another receiver before blaming the transmitter.

Any responsible repeater group will have the deviation of its transmitter set to just below the maximum system deviation of 5kHz to avoid splattering across other channels. Your deviation set to half of their value will be just under 2.5kHz. The method is obviously not precise, but has a sufficient degree of accuracy to improve the signal of most packet stations.

A full copy of the article can be obtained by writing to MacPac secretary 3 Woodhead Ave, Bothwell, Lanarkshire, Scotland. G71 8AR. Incidentally MacPac have also produced a very informative User Guide for the AA4RE Mailbox.

Monthly forwarding league.

After the first results were published a few messages appeared on my mailbox complaining that various stations appeared at or near the bottom, when they were only there due to station problems. Some SysOps, having now seen the full list, have asked the PWG for help in finding better routes. If you are at the bottom (I am very near it this month!) it may reflect equipment problems, but if you feel you may like some information about alternative routes drop me a line. Last month's times are shown in brackets. Next month I hope to be able to say why there is such a wide gap between the best and worst links.

Top
G0?CRG <> GB7CHS 14.5 mins (51!
G0?EYM <> GM7CYM 15.0 mins (NA)
G0?HIU <> GB7HHH 17.4 mins (29)
Bottom
G0?GHU <> G0?HIU 4343 mins (NA)
ON4HU <> G0?ZAA 4432 mins (NA)
G0?SUT <> G0?SPV 8355 mins (8199!

Sorry...

I published in February, under the heading Mod of the Month, an article on how to modify a 2 metre transceiver for use with 9600 baud modems. Some correspondents observed that by publishing the modification the RSGB had advocated 9600 baud operation on the 144MHz band in this country. This is not the case. As this publication reaches 150+ countries, some of which do advocate the use of 9600 baud packet on 144MHz owing to their larger allocation on this band, I felt that there was no problem with publishing the modification. My apologies if you found this misleading.

Who's who on the RSGB's Packet Working Group

The last time this item appeared it contained a number of errors (obviously not sent by packet!). Here is a corrected and updated list.

Chairman:- Ian Suart, GM4AUP (QTHR). Tel: 0236 65937. (SysOp GB7MAC)

Mailbox Coordinator:- Neil Lasher, G6HIU (QTHR). (SysOp GB7HIU)

Note this is a change

Site Clearance:- Dave Hough, G4WRW (QTHR). (SysOp GB7FC)

Other PWG members:-

G0/K8KA (GB3UP); G0EOJ (GB7YAX); G3VPF (GB3/GB7DP); G3XDV (GB7HQQ); G4CCC (RMG); G4MTP (GB7DV); G8IMB (GB7IMB); G8KHV (GB7AP); G8LWY (GB3KP).

Corresponding Members: G1DIL, G3MRX, G3NRW, G3PLX, G3RUH, G3RWL, G3XTT, G3WDG, G3UBX, G4ASR, G6DLJ, G6KVK (TCP/IP address coordinator), G8ONH.

MIKE DIXON G3PFR
'Woodslock', Grazebank, Norley,
Warrington, Cheshire WA6 8LL

Developments at 10GHz

For some years now, narrowband developments at 10GHz have been somewhat static in the UK. Meanwhile, German developments in the field have gone to successful "hybrid" designs, using a combination of pcb techniques and "pill-box" resonators. Heavy use has been made of GaAsfets in these designs, both as amplifiers and active multipliers and mixers. Our German colleagues have had readier access to a bigger variety of GaAs devices - and at lower price than in the UK.

With the renewed interest created by the G4DDK designs for the lower microwave bands - principally easy-to-get-going, self-contained oscillator multiplier strips, the availability of MMIC amplifiers to about 3 or 4GHz and "surplus" GaAsfets (for example, Birkett), G3WDG and G4DDK have been working, with a high degree of success, on "UK" 10GHz designs.

Progress to date has resulted in 10GHz sources based on the DDK004 board (mentioned last month), followed by a MMIC amplifier and active (GaAsfet) quadrupler and filter to either 10224MHz for a receiver lo, or to 10368MHz for CW/TX or beacon use. The receiver lo can be quite easily made to yield 5mW or so at the mixer injection frequency, more than sufficient to drive an active (or passive) mixer. It also appears that it may be quite easy to build a 20dB RF "gain-block" with reasonable noise figure to precede the mixer. On the transmit side, it seems that between 50 and 100mW can be easily and economically obtained, a very potent level for devices such as beacons or as a driver for higher powered solidstate amplifiers to perhaps a Watt. Like the ads. say "We're getting there..."! Keep your eyes open in the *Microwave Newsletter* for progress reports on Charlie and Sam's experiments.

A further spin-off of this work is that a few minor alterations have been made to the DDK004 design (not affecting the pcb mentioned last month) which improve the output from about +5 or +7dBm to +9 or +10dBm, a very worthwhile improvement. The most significant changes are to substitute a BFR91A for the BFG91A (which tends to be a little "lively") in the final multiplier, some rearrangement of trimmer positions in the final stage and some additional emitter decoupling in the remaining stages. Again, more details later.

More on 10GHz TV repeaters

Feedback from RMG (Repeater Management Group) has brought to light a channel numbering system which identifies the band concerned. For instance RMT has for some time indicated a TV repeater channel. It is proposed that the next digit(s) indicate the band and the last digit the channel number viz: on 1·3GHz, RMT1, RMT2 etc; 2·3GHz, RMT21, RMT22 etc; 3·4GHz, RMT31, RMT32 etc; 5·7GHz, RMT51, RMT52 etc; 10GHz, RMT101, RMT102 etc; 24GHz, RMT241, RMT242 etc. This is, of course, looking a long way ahead and recognising that some of the in-between bands are not wide enough to support in-band repeaters, although it might, at some time in the future, prove possible to enable cross-band experimental devices. Therefore, for the 10GHz channels mentioned last month, TV0, TV1 and TV2, now read RMT101, RMT102 and RMT103.

Sam, G4DDK has pointed out that although these channels are of nominal 10MHz bandwidth and 25MHz separation, the total bandwidth of such a transmission is likely to be around 30MHz, more than the channel separation. However, 10GHz repeaters are likely to be "neighbourhood" devices rather similar to the "MVDS" systems which various commercial organisations are talking about in the millimetre bands with a "normal service area" of up to perhaps 20km (depending on terrain and intervening obstacles). It is probably unimportant to change the channel spacing since the "reuse" distance is quite small under normal conditions and if should not be an impossible task to allocate operating channels by geographical separation to avoid problems. Nevertheless, there is a case for reconsidering the position, which will be done at the Microwave Committee's next meeting - now that the band is, at long last, beginning to fill with propositions! Dave, G4NJU, one of the RMG Special Project Co-ordinators, in passing on the channel nomenclature asked whether the Novice Licence will allow TV on 10GHz. The answer (subject to DTI approval, of course) is most definitely YES - of the microwave bands, 1·3 and 10GHz have been nominated and agreed in principle, no restriction on modes or antennas, but operation to bandplan essential. One of the main reasons for nominating these two bands is that they are practical for the beginner (especially 10GHz) and will encourage the use of wideband modes, such as TV, for "non-wired" video, data and control links. What better way for the beginner to become acquainted with simple equipment and techniques?

Changes to IARU bandplans.

By the time you read this, the Region 1 Conference will be over and the real work, leading up to WARC '92, will begin. I've had a few responses to the proposed IARU Region 1 bandplan changes which were mentioned in the March column. The first was from Steve Berry, G4LRT, who has been very active, in years gone by, on many of the microwave bands including 2·3GHz and 10GHz narrowband. Steve's response was against moving for a number of reasons. At 2·3GHz he points out that many (of the older - my words) designs for 2·3GHz were dimensioned for 2304MHz and could be made to work at 2320MHz but that 2400MHz might well be outside the operating range. The wideband nature of modern pcb designs rather negates this argument, as witness the range of the 'DDK designs! Also, everyone concerned will "have to fork out for new crystals AGAIN and leave the bottom of the band vulnerable to takeover". He also pointed out that 2400MHz is "closer to the microwave oven 2450+/-rubbish" and is in the space band where there are currently beacons in operation in space. "Please campaign for all countries to use 2320 or, even better, 2304MHz rather than have everybody move yet again - the same problems exist on 6 and 3cm".

Unfortunately it is highly unlikely that, in Region 1, we will ever again be able to use frequencies below 2310MHz and may have to face the fact that the only truly "common" area is around 2400MHz, in the space allocation which is currently world-wide. It also happens to be occupied by powerful (in some parts of the UK) professional signals as well as amateur satellites. Don't forget, too, that this part of the band was allocated to the amateur service long before the amateur satellite/space service came into being - we may even be forced into the position of claiming "squatters rights"!

Alan, G2HIO, taking a slightly different viewpoint, commented that getting going on Mode S was made difficult by the fact that the satellite frequencies are so far removed from the beacon frequencies (when using the conventional 144-146MHz IF) that he had to build a signal source especially to line up his equipment for best performance at 2400MHz. Had they been closer, one of the RSGB beacons could have been used - in Alan's case GB3LES near Leicester, Alan being near Derby. A move to just below 2·4GHz would, he maintains be most welcome, as it would immediately solve such problems and encourage people to use their satellite equipment for terrestrial uses as well, thereby stimulating local activity - similar reasoning to that used some years ago, when we recommended adjacency of NB and WB working on the 10GHz band! Alan mentioned, for those not familiar with current satellite microwave activity, that Oscar 13 uses 2400·711 - 2400·747MHz, with beacons as follows: OS13 beacon 2400·660MHz, PacSat beacon 2401·1428MHz and Dove beacon 2401·2205MHz.

The Winchester Round Table.

Ted, G4ELM, as usual sent in a very detailed report of the proceedings of the Winchester Round Table, held by kind permission of the IBA at their Crawley Court establishment. About 31 active microwavers were present.

The discussion theme was compass bearings, dish alignment and related topics, with an oft repeated presentation of their "standard" methods by Chris, G0FDZ and Alan, G8BJG.

Simon, G8KRD, gave a talk on the commercial exploitation of frequencies above 30GHz, necessarily "curtailed" by the sensitive nature of some of his employers work ie. an interest in such frequencies.

Round Table discussions followed and centred on the 1990 Cumulatives and the use of various sites by almost all those present as they revealed their intentions for the forthcoming season. G0FDZ and G8BJG would be in Guernsey in July and G4EFT in May, offering an opportunity for rare 10GHz DX. F6DPH (with 5·7GHz also) and F8WN expected to be active again this season and various UK operators would be scattered across various popular sites, together with, perhaps, a few new ones. G4EFT, G2DSP and G4ETU indicated that they would also be operating on 24GHz, G3FYX has equipment for most bands and is happy to bring out any particular band on request. G4AUC could offer skeds on 3.4GHz, again on request. For more detail than possible here, see the *Newsletter* or contact G4ELM, OTHR.

The final discussion of the day, led by F8CUX, was on beacons, both formal and personal. GB3CMS, Danbury, reported here some time ago, had not yet been heard by anyone at the meeting, although GB3SWH and GB3IOW were reported as "healthy" and GB3ALD had not been heard since September 1989. The proposed Reigate beacon, GB3SEE, was at an advanced stage of development and a site had been found and agreed. G3YGF now had all the hardware for the "Basingstoke" beacon which he proposed to run as a personal beacon in the Salisbury area. G3JMY was running a multimode (on request) attended personal wideband beacon from near Bristol - Ted is OTHR.

Perhaps I should add that there have been interested enquiries for at least two other formal narrowband beacons, although the submissions have not yet been made.

BDB TREACHER BRS 32525
93 Elibank Road, Eltham, London SE9 1QJ

Space is at a premium this month, so I shall apologise now if your offering is not included in this month's news.

HF Challenge

Last year's Challenge was better supported, with nine logs for the SSB event, and three for the CW leg.

Once again, entrants felt that the idea of an SWL competition during a major contest was an excellent idea. As you would expect, the longer spent by the rig, the higher the score. 28 and 14MHz were the bands to monitor with several entrants around the 100-country mark on both bands. Conditions for the SSB section were quite good and there was always something to take the mind off retreating to bed, or helping the wife with the chores!

The CW leg was actually blessed with three logs this year, representing a 50% increase on recent years. This year Robert Small BRS8841 got the better of Jean Jacques Yerganian ONL-383, with Mike Parent BRS88763/568 coming home third. In the SSB section, Jean Jacques turned the tables, with a handsome victory. Full results are shown above.

TSTL

Readers will remember me mentioning this a few months ago. Kazimierz SP9-3110-KA has written again, having moved to West Germany where he holds the SWL callsign of DE1KCG. He runs "The SWL Club" there and has promised to send details. Brief details for now are that the Club helps you find SWL penfriends, exchanging your SWL experience and comparison of results, and being able to claim some awards a little more cheaply than the usual 10 IRCs. Annual payment is 10 IRCs. You will get your own SWL Club Membership number, quarterly newsletters, a QSL Manager's Directory, and other services. Further details can be obtained from Kazimierz Czech, PO Box 200233, D-5060 Bergisch Gladbach, West Germany.

It is interesting to note that several TSWL members are also licensed. SP9LJD recently operated as 9N1MM, and PP1CZ was ORV from Trinidad is signing ZZ0TA in early April.

Being honest!

Every month I see some loggings from which I compile the "Spectrum Analysis" column that give me serious doubts about whether an SWL has actually heard the station he reports. I am, of course, referring to the trusty 3x3 report. I can understand why someone with an "average" set-up will be hearing stations at a reduced readability and signal strength compared to other listeners who have a superior rig and antennas, but my concern is that some SWLs hear something in the noise — especially on 3.5MHz — and think they have heard a rare piece of DX — and haven't. It is all about being honest with yourself. It's the same as when you hear stations working in "lists" say "I QSL the 4X4", when you have heard the DX station state quite clearly "No copy".

Similarly, a score in the Annual Table very much depends on your criterion for having heard a station. Most of those who have been SWLs for any length of time will not count a country as heard unless they have heard the station give his own call, callsigns of stations being worked and the reports given to those stations. If every SWL adopted such a criterion for "hearing" a station we would quickly rid logs of the 3x3 report.

SSB:

POS'N	STATION	COUNTRIES	POINTS	TOTAL
1	ONL-383	496	1,272	630,912
2	BRS8841	382	957	365,574
3	BRS28198	224	502	112,448
4	BRS25209	229	488	111,752
5	SP9-3645-KA	140	316	44,240
6	BRS88763/568	84	199	16,716

Check Logs: BRSs32535, 62088, 88969

CW:

POS'N	STATION	COUNTRIES	POINTS	TOTAL
1	BRS8841	260	660	171,600
2	ONL-383	195	441	85,995
3	BRS88763/568	84	230	19,320

1989 UHF/VHF SWL Championship

Last year's Championship attracted six entries — slightly better than in 1988. Again it was a fairly close-run affair between the few listeners that enjoy UHF/VHF competitions. The winner was Martin Parry BRS52543 who entered six of the seven events and won the Hanson Trophy by a margin of over 1,200 points from yours truly. Mick Toms BRS31976 and Norman Henbrey BRS28198 were not far behind. The full results are shown below.

This year, with all VHFCC contests having an SWL section, and fresh SWL rules for these events, the VHFCC sincerely hope that there will be far greater support.

Pos'n	Station	Points
1	BRS52543	6,223
2	BRS32525	4,967
3	BRS31976	4,243
4	BRS28198	3,959
5	BRS25429	1,000
6	BRS37798	431

ILA News

Trevor GW4OXB provided the latest news of the International Listeners Association. He had been busy sorting through return questionnaires from many members, some with interesting ideas to improve the Association's image.

It was good to note that their 1st Prefix Contest was well supported with 14 logs received. This was another SWL event arranged in conjunction with transmitting events, and the extra activity these prompt make for a healthier input from listeners.

The ILA address is 1 Jersey Street, Hafod, Swansea, SA1 2HF.

Trifilar balun

Readers will recall mention of Peter Riley's (BRS41542) Tripole Sloper in the column during the 80's. He is now licensed as G0KTT and has devised a 'trifilar balun'. He maintains that this obviates the need for ATUs and varicaps from 1.8-30MHz. I have little space to provide details this month but hope to be able to do so next month. For those who cannot wait that long, you can write to Peter at 20 Arthog Road, Hale, Altrincham, Cheshire, WA15 0LY, enclosing an sase.

Newcomers

Not really a newcomer in the correct sense of the word, but John Heath BRS92658, after a 30 year gap, has returned to the hobby to find it transformed with much more about VHF, satellites, packet radio, etc. He has an FRG8800 receiver and has gained much pleasure with his main interest, dxing on 3.5MHz.

John wants to get off on the right foot as far as QSLing is concerned and asked for advice. I have said much about QSLing techniques in the past and will try in the next couple of months to pull together some of the main "do's" and "dont's" — with apologies to my established readers. As there are always newcomers joining the Society, the space should be well utilised.

Andrew McClean is RS92002. He lives in Ballymena and is a member of the local Society. He has been interested in shortwave listening for about 18 months and is active on 70, 144 and 432MHz. Each year he is part of the team which mounts a expedition to Rathlin Island.

Finale

For all the latest DX news, read my Spectrum Analysis column at the front of the magazine. Deadline for the next SWL is Monday 21 May.

RONALD M COWAN, GM4SRL
516 Clarkston Road, Netherlee, Glasgow G44 3RT

Flooding

The weather so far this year has been one of the worst on record, affecting a large part of the United Kingdom. By March over six feet of rain had fallen on Oban in Argyll, and many other parts of the country were returning similar figures. Winds have been higher than usual, with gales being regularly forecast.

Many RAYNET groups were involved with the emergency services during this period. At 1100 on Thursday 25 January, Herts County Controller Trevor Groves, G4KUJ, received a call from the County Emergencies Planning Officer stating that Hertfordshire Police had requested that Herts RAYNET be put on standby. This was changed to a callout at 1600. The highways radio system had failed and RAYNET were asked to set up in the CEPO's Emergency Centre passing the Highway Department's traffic, (mainly from the north and east of the county) to and from the highways control. Owing to poor road links caused by fallen trees the net was not operational until 1800, but from then until 2130 RAYNET operated on behalf of CEPO. The three groups who were involved were Mid Herts., (called out) North Herts., (called out) and South West Herts. who were on standby and would have provided the night shift if required.

One of the worst hit areas was north Wales. RAYNET, under the leadership of Bob Cardwell, GW4PUX, Clwyd County Controller, provided communications for the police and the social services during the flooding which hit Towyn and Kinmel Bay from 26 February until 2 March. Eleven main stations were set up, most enquiries being from the North Wales Police Headquarters and the police incident room at Abergele from where information on the state of the tides and the sea wall was originated. Other information from these stations was mainly for the rescue workers including Mountain Rescue, RNLI and Air Sea Rescue. Traffic passed included constant requests for information regarding the whereabouts of displaced residents, requests for dry clothing, blankets and toiletries. Messages were handled on behalf of the social services regarding housing and pet problems. There was third party traffic to the RSPCA and Animal Shelter. Requests were made regarding social security payments for evacuees who had left their homes without cash. The CEPO and EPOs regularly made use of the net in order to keep the emergency services up to date with the location of their officers and Mountain Rescue passed traffic to

the rest centres about incoming evacuees. The nets opened each day at about 1000 and continued until 0130 the next morning. The six RAYNET groups involved were West Clwyd, East Gwynedd, Anglesey, Hollymell, Powys and Wirral. Almost all of the communications was done on the 144MHz band without the use of talk-through facilities.

Try a social evening

I have to thank John Gray, GW6ZUS, group secretary of West Glamorgan RAYNET for the following information from his area. The West Glamorgan group, according to John, has during the last five years turned itself from a group of licensed amateurs meeting in a pub to a most acceptable RAYNET group. The change started when British Red Cross group 100 invited RAYNET to a hang gliding event. Interest was aroused and with the patient help of several group controllers, G8TUX, G1BFB and G4KAW, the group has flourished and in 1989 eighteen user service events and two five callouts were undertaken. It had become apparent to the group that they only met their user services under rather formal conditions, for example planning meetings, exercises, events, etc. Last winter it was decided, in an attempt to get to know everyone better, that they would host a social evening. John recommends that those who have never embarked on such a venture give it a try as the results were well worth the effort.

The guest list included British Red Cross (from both county and groups), CEPO, County Ambulance, Police Divisions, Coastguard, South Wales Cave Rescue, the National Trust Ranger and the county council Country Park Rangers, the Salvation Army, WRVS and representatives from two local CB clubs. The night chosen, 7 February, was one of the many during which West Wales was suffering the wilder attentions of the environment. Red warnings were in force on a number of rivers, high winds were causing havoc on both land and sea, and people were being advised on radio and television to stay indoors. Despite a number of late cancellations over 70 guests arrived and enjoyed an evening talking to each other on many subjects. The evening was so successful that a repeat performance is on the cards for next year. Well done, W. Glamorgan.

80 metre national controllers' net

I must first disclose a personal interest! Scottish stations have always had problems joining in on the Sunday nets at 0830 local time, and the national committee has been looking at several suggestions to overcome the problems of poor national coverage on 3.663MHz. The problem is compounded some Sunday mornings by USB transmissions on the same frequency from a Scottish coast radio station. Several suggestions have already been received. These include splitting the net into two (north and south), splitting it into 40 and 80 metres, or using 80 metres for the news at 0830 and the net until 0900, and 40 metres for the 0900 news followed by the rest of the net. All suggestions would be welcomed by the national committee chairman, Philip Howarth, G3YAC QTHR.

European Special Olympics

As I write this column, I am waiting to hear how many RAYNET operators will be provided with halls of residence hospitality by the games organisers. There are over 90 offers of operator help covering a variety of combinations of dates so far, but unfortunately the organisers have been unable to find a corresponding number of beds. About 125 operators will be required each day from 20-27 July, and offers of help, particularly from those who can arrange their own accommodation, would still be welcome on 041—637 4383. Mentally handicapped athletes from 30 countries, together with their volunteer helpers, will descend upon Strathclyde for the duration of the games. Norma Sunderland, whose husband Don, G8FHM, was an operator last year at the British Games in Leicester writes, "I have to admit that I was not really looking forward to the week as firstly I am not into amateur radio, and secondly have never had any experience of meeting mentally handicapped people, and was not sure how I would cope. Geoff Griffiths, G3STG, Leicestershire County Controller, was not only a mine of information, but also a perfect diplomat in the way he organised everyone and gave great encouragement and confidence. Apart from the games there was a good social programme, and a farewell party to which all were invited. After it was all over, it seemed to be an anticlimax to have to pack up to go home. It was a pity that there was not more time for a RAYNET get-together, but perhaps all would have taken the opportunity to sleep! Yes we did get tired, cross and frustrated at times, but yes, we did have a wonderful and rewarding time. It was great to meet everyone, especially the wonderful olympians."

Newsletters

Thank you to all who have sent me county and group newsletters and also to those who have taken the time to send articles for this column. Anything for the July RAYNET column should be sent as soon as possible, and not later than 20 May, to the above address.

ARTHUR GEE, G2UK
21 Romany Road, Oulton Broad, Suffolk NR32 3PJ.

We do not hear a lot about Japan's space activities over this side of the world, but they are as active in this field of technology as one would expect. They became the third country to launch a spacecraft to the moon, when their Musas-A spacecraft was recently launched from the Kagoshima Space Centre by their Institute of Space and Astronomical Science. The mission consisted of two spacecraft, one 140cm in diameter and 80cm high, the other, designated the lunar orbiter, was 40cm diameter and 37cm high and was attached to the main spacecraft. The two were injected into a 400×240km orbit around the earth and after two revolutions a solid fuel rocket motor was fired, putting the spacecraft into an elliptical orbit to pass within 16,000km of the moon. Then the main spacecraft released the lunar orbiter which fired its own rocket to place it in orbit. Scientific data was sent back to earth.

Satellite update

In the field of amateur satellites Japan has been equally active, their first involvement being the JAS-1 satellite. Approval for the launch of this project was given by the Space Development Committee of their Prime Minister's Office in 1983 which agreed to launch from their H-1 launch vehicle which had been developed by NASDA — the National Space Development Agency of Japan, some time earlier; its construction was undertaken by the amateur satellite committee of JARL. The project took them five years to complete and JAS-1 was launched successfully on the 12 August 1986 from the NASDA Tanegashima Space Centre. This was quite a complex satellite providing transponder and data facilities, but, after three years of successful operation, it was terminated in November 1989 due to gradual decrease in power generation.

At the time JAS-1 was being built, a second satellite was constructed with the same communications configuration as a backup for JAS-1. On completion, this second satellite was 'moth-balled'. This was just a little larger than JAS-1 and ultimately became JAS-1b, which has just been launched and is now in orbit. The system configuration can be divided into three parts; the communication/operating system, the power supply system and the ancillary components. The communication/operating system which is the mission of the satellite, includes the analogue transponder, the digital transponder and the antennas. The power supply system consists of solar panels, nickel cadmium batteries and devices to control charging and discharging the batteries.

JAS-1b was launched as a secondary load with MOS-1b on the H-1 rocket. This satellite's mission was to observe various points on the earth's surface which required it to be in a solar synchronous orbit at an altitude of 900km and an orbital inclination of 99 degrees. In this orbit, the sun is eclipsed by the earth for about 103 minutes. This means that power can only be supplied by the solar cells for about 69 minutes — during the remaining 34 minutes power must be drawn from the storage batteries. Unfortunately JAS-1b is small in size with a limited capacity of power generation so this orbit is not entirely satisfactory. Consideration had to be given to obtaining a more favourable period for power generation by raising the apogee of orbit of JAS-1b by several hundred kilometres above that of MOS-1b and thereby making the orbit slightly elliptical. However, JAS-1b has no thruster of its own and thus is incapable of changing its orbit. Extra thrust could be obtained by burning fuel remaining in the second stage of the H-1 rocket after separation from MOS-1b. Raising the apogee by 300km to 1200km would, about 150 days after launch, result in a drop in the eclipse ratio, ie the ratio of eclipse time to the orbital period, then from about day 300 to day 470, the satellite would be in a period of no eclipse. During this period, the power condition of the satellite would be improved. This means that passes of JAS-1b will be around local noon and midnight two or three times after separation from the rocket and this will shift gradually with variations of eclipse rate and when eclipse becomes zero, passes will be around dawn and twilight. Orbital predictions therefore look like being a bit tricky!

JAS-1 has 979 silicon solar cells, 2cm×2cm square, which produced an average of 6.5W at the beginning of their life. At this level continuous operation was not possible as the system was drawing power all the time from the storage batteries even when the satellite was in full sunlight. With JAS-1b, gallium arsenide solar cells were used, and the slightly larger size of JAS-1b increased the effective surface area enabling 11W of solar power to be generated. Another improvement over JAS-1 is that a ring-type turnstile antenna is used for uplink receiving, making antenna directing for the ground station easier and giving a more stable uplink signal. Even though polarisation of both receiving and transmitting antennas is circular it is anticipated that transmitting and receiving should be easily accomplished with linearly polarised antennas, as the loss should only be about 3dB.

At the time of writing, JAS-1b has been putting out good signals — particularly on CW.

ICOM

IC-751A HF ALL-BAND TRANSCEIVER

- **Amateur Bands 160m - 10m.**
- **General Coverage Receiver.**
- **105db Dynamic Range.**
- **100W Output (40w A.M.)**
- **32 Memories.**
- **Electronic Keyer.**
- **CW Semi/Full Break-in.**
- **HM36 Microphone.**

The ICOM IC-751A was created for the ham operatar wha demands high perfarmance whether entering contests, chasing DX ar just simply enjaying the shortwave bands. It is an all made salid state transceiver with a hast of features designed far the crawded HF bands af taday.

Additianal features include 9MHz natch filter, adjustable AGC, naise blanker, RIT and XIT. A receiver pre-amp and attentuatar pravides additianal cantral when required. The FL32 9MHz/500Hz CW filter is fitted as standard with CW sidetane an Rx and TX mades. On SSB the new FL80 2.4Khz high shape factor filter is fitted.

The transmitter is rated for full 100% duty cycle with a high perfarmance compressor for better audia clarity. With 32 memory channels and twin VFO's, scanning af frequency and memories is possible fram the transceiver ar the HM36 microphane supplied.

The IC-751A is supplied far 12v operation but can be used with either internal or external A.C. pawer supply. It is fully compatible with ICOM auta units such as the IC-2KL linear amplifier and the AT500/100 antenna tuners.

Options available:- PS35 internal AC pawer supply, PS15 external AC power supply, EX310 voice synthesizer, SMB desk microphone and SP3 external loudspeaker.

Icom (UK) Ltd.
Dept RC, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour.

Count on us!

IC-726 HF/50MHz ALL MODE TRANSCEIVER
HOT ACTION ON THE HF AND 50MHz BANDS

Now that the HF and 50MHz bonds enter o period of intensity, conditions for long distance communcations have never been better.

The new ICOM IC-726 is a campact, easy ta use transceiver which covers the amateur bands fram 1.8 ta 50MHz. It can be used in yaur hame, car and in partable lacatians an SSB, CW, AM and FM mades.

With minimal switches and cantrals enjay uncamplicated aperating far beginners or veterans alike. And ICOM have incarparated their superiar DDS (Direct Digital Synthesizer) system, a feature that enhances PLL lack up times. The same feature is built inta ICOM's state-af-the-art IC-781 advanced H.F. Transceiver.

Other features include a general caverage receiver, dual VFO's, band stacking registers, attenuatar, pre-amp, naise blanker, RIT, memaries and much mare. R.F. autput is 100W an the H.F. band and 10W an 50MHz band fram separate antenna sackets.

An aptianal AH-3 H.F. Autamatic Tuner will allaw yau ta aperate an the H.F. bands in any location. Just push the tuner switch an the IC-726 and the tuner autamatically adjusts far a minimum VSWR. The tuner can match a 12M langwire acrass the 160-10M bands. Use the weather resistant AH-3 in yaur car (with AH-2b mount and whip) boat, at hame ar in the field.

Options and Accessories:

AH-3	H.F. Automatic tuner
AT-150	A.F. Autamatic matching tuner
PS-55	AC pawer supply
CR-64	High stability crystal
FL-100	CW narrow filter 500Hz
FL-101	CW narraw filter 250Hz
SM6/SM8	Desk micraphones
SP7	External laudspeaker

Icom (UK) Ltd.
Dept RC, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour. Fax: 0227 360155.
Visa & Mastercards: Telephone orders taken by mail order, instant credit & interest-free HP.
Despatch on same day whenever possible.

Quality & Style, Personalised for you

QSP YOUR ORDER TO RSGB

Design Style - 1
RSGB logo in black and gold plus your **call sign** in gold

Design Style - 2
RSGB logo in black and gold plus your **name** in gold

Design Style - 3
Your **call sign** in gold plus your **name** in blue

Normal RSGB Mail Order Terms and Conditions apply, please see Mail Order Price List for details.

A Lambswool Sweaters

Machine washable. Made in England. Gift boxed.
Colours: **Maroon, Navy, Black, Red, White, Grey, Sky Blue, Yelfow.**
Sizes to lit chest: **34, 36, 38, 40,42,44"**
Price: **£26.75**

B Acrylic Sweaters

High quality. Machine washable. Made in England. Gift boxed.
Colours: **Maroon, Navy, Black, Red, White, Grey, Sky Blue, Yellow.**
Sizes to fit chest: **34, 36, 38, 40,42,44"**
Price: **£19.50**

C Acrylic Slipovers

High quality. Machine washable. Made in England. Gilt boxed.
Colours: **Maroon, Navy, Black, Red, Whife, Grey, Sky Bfue, Yellow.**
Sizes to fit chest: **34, 36, 38, 40,42,44"**
Price: **£18.35**

D Shirts/Blouses

Shirts: White poly cotton. Machine washable. Made in England. Long or short sleeves.
Order by collar size:
14,14½,15,15½,16,16½,17,17½, 18,18½.
Blouses: White poly cotton. Machine washable. Made in England. Long or short sleeves. Sizes: **S,M,L.**
Price: **£18.99**

E Sweatshirts

Heavy quality fleece. Machine washable. Made in England.
Colours: **Maroon, Navy, Black, Red, White, Grey, Sky Blue, Yelfow.**
Sizes: **S,M,L,XL.**
Price: **£13.75**

J British Sports Shirts

Superior quality, short sleeve 65% polyester/ 35% cotton pique knit. 2 button neck, knitted collar. Machine washable.
Colours: **Navy, Black, Red, Whife, Sky, Royal, Bottle Green, Lemon.**
Sizes: **Small**(34/36"), **Medium**(38"), **Large**(40/42"), **Extra Large**(44/46").
These garmenfs are **not** Imported and will machine wash without losing (or gaining) shape.
Price: **£15.95**

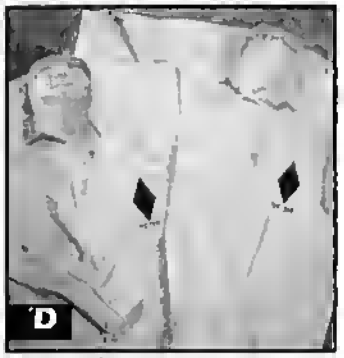
K 'Breeze' Leisure Jacket

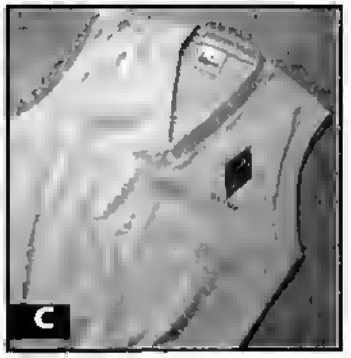
Good looking and comfortable 'wear anytime' zip up jacket. 2 pockels and one Inside pocket. Knitted cuffs and waist. Stand up collar. Poly/cofton fabric with nylon tilling. British made.
Colours: **Navy, Red, White, Royal.**
Sizes: **Small, Medium, Large, Extra Large.**
Price: **£29.95**

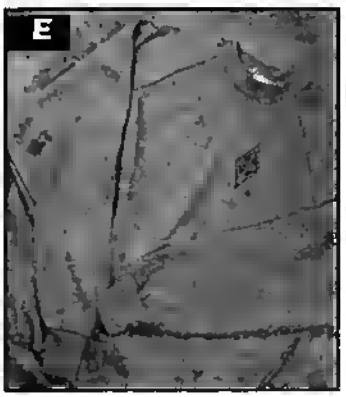
Exclusive to RSGB Members

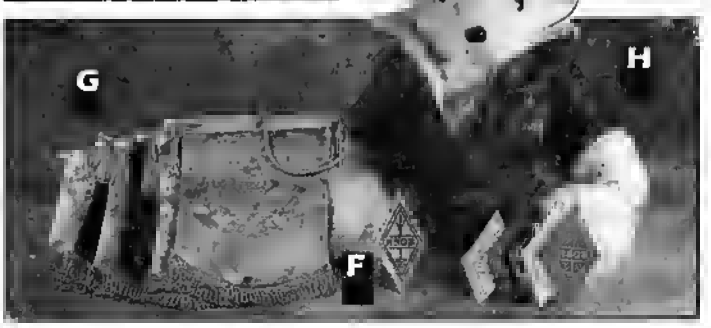
F Sew on Badges

4½" long. Ready to sew on. RSGB logo embroidered onto length of membership colours. (Please state number of years when ordering).
Price: **£1.95**









G Shack Banner

9x6" Ready to hang. RSGB logo plus your own call sign and number of membership years embroidered onto length of membership colours. (Please state number of years when ordering).
Price: **£7.95**

H Ham Bear

18" Tall. Fully jointed collectors bear with headphones. RSGB logo and your call sign embroidered onto his jacket. Definifely not a toy. Made in England.
Price: **£29.95**

CONTEST NEWS

RULES

21MHZ CW CONTEST 1990 RULES

TRANSMITTING SECTION

1 General: All entrants should note that there is a change in the format used for the multiplier in this event. The UK County Code replaces the previous UK Prefix and overseas entrants should calculate their multipliers on the number of different county codes received from UK stations.

2 Eligible entrants: Overseas (including EI) - all licensed amateurs. British Isles - Class A licence holders, who must be members of RSGB. Single-operater entries only will be accepted.

3 When: 0700 to 1900gmt. Sunday 21 October 1990.

4 Sections:

(a) British Isles

(b) Overseas (including EI)

(c) British Isles QRP

(d) Overseas (including EI) QRP

QRP stations may use 10W RF OUTPUT or less.

5 Frequency/Mode: 21MHz CW only. Entrants are requested not to operate in the band 21.075 - 21.125MHz.

6 Contest Exchange: RST and serial number, commencing with 001. UK stations must also send their County Code as listed at the end of these rules. No points will be lost if the full information cannot be obtained from a non-competing station, but any contest exchange sent by that station should be logged.

7 Scoring:

(a) British Isles stations. Each completed contact with an overseas station will count 3 points. The final score is the total of QSO points multiplied by the number of countries worked. The ARRL Countries List will apply, with the exception that VO1, VO2, and VE, VK, ZL, JA and USA numerical call areas, irrespective of prefix, will all count as separate multipliers. Contacts with stations in the British Isles (excluding EI) will not count for points or multipliers.

(b) Overseas stations. Work only British Isles (excluding EI) stations. Each completed contact will score 3 points. The final score is the number of points scored multiplied by the number of different Counties worked. Contacts with stations using the special GB prefix will not count for points or multipliers.

8 Logs: Entries should be typed or written in ink on one side only of standard (A4) size paper or pre-printed log sheets, and should contain 40 QSOs per page. Columns to be headed: Time gmt; callsign of station worked; RST and serial number sent; RST and serial number received; multiplier (if new); points claimed. Computer-generated logs are welcomed provided they are formatted as above.

Duplicate contacts must be clearly marked and not claimed for points. Each unmarked duplicate contact found for which points have been claimed will result in the deduction of 33 points. Entries containing more than 5 such duplicates will be liable to disqualification.

Each entry must be accompanied by a cover sheet (RFC2 or equivalent) indicating the section entered and power used, as well as the usual details of equipment and aerials. Also don't forget the operator's name and address!) and a list of the multipliers worked.

Entrants making more than 80 QSOs are requested to include a check-list of the callsigns appearing in the log, sorted into alphabetical order and with either the serial number sent or the time of contact beside the callsign.

9 Declaration: Each entry must be accompanied by the following declaration, signed and dated: "I declare that this station was operated strictly in accordance with the rules and spirit of the contest, and I agree that the decision of the Council of the RSGB will be final in all cases of dispute." UK entrants must further state "I have no objection to the information from my log being entered into a computer for the sole purpose of the contest adjudication." (Data Protection Act).

10 Address for logs: RSGB HF Contests Committee, PO Box 73, Lichfield, Staffs, ENGLAND.

11 Closing Date for logs: British Isles entrants, 19th November 1989; Overseas entrants, 17th December 1989.

12 Awards: The leading British Isles station will be awarded the T.E.Wilson G6VO Trophy. Certificates of merit will be awarded to the second- and third-placed British Isles stations, and to the leading three overseas entrants. Additional certificates may be awarded (at the discretion of the HF Contests Committee) to the leading stations from each overseas continent/country.

RECEIVING SECTION

Rules as for the transmitting section except where specified below.

2 Eligible entrants:

(a) British Isles - RSGB members only

(b) Overseas - all SWLs

Holders of transmitting licences for frequencies only above 30MHz may enter the receiving section.

7 Scoring: British Isles SWLs should log only overseas stations in contact with British Isles stations participating in the contest. Overseas SWLs should log only British Isles stations in contact with overseas stations participating in the contest. Scoring and multipliers as for the transmitting section.

11 Logs: Columns to be headed: time gmt; callsign of station heard; report and serial number sent by that station; callsign of station being worked; multiplier; points claimed.

NOTE. In the column headed "station being worked" the same callsign may only appear once in every three contacts except when the logged station counts as a new multiplier.

Each entry should be accompanied by the following declaration, signed and dated: "I declare that the station was operated strictly in accordance with the rules and spirit of the contest and I agree that the decision of the Council of the RSGB shall be final in all cases of dispute. I do not hold a transmitting licence for frequencies below 30MHz." UK entrants must further state "I have no objection to the information from my log being entered into a computer for the sole purpose of the contest adjudication." (Data Protection Act).

12 Awards: Certificates of merit will be awarded at the discretion of the HF Contests Committee to the leading three entrants from the British Isles, and to the leading entrant from each overseas country.

MULTIPLIER LIST FOR OVERSEAS ENTRANTS - UK COUNTIES

County	Code
Alderney	ALD
Co Antrim	ATM
Co Armagh	ARM
Avon	AVN
Bedfordshire	BFD
Berkshire	BRK
Borders	BDS
Buckinghamshire	BKS
Cambridgeshire	CBE
Central	CTR
Cheshire	CHS
Cleveland	CVE
Clwyd	CWD
Cornwall	CNL
Cumbria	CBA
Derbyshire	DYS
Devon	DVN
Dorset	DOR
Co Down	DWN
Dumfries & Galloway	DGL
Co Durham	DHM
Dyfed	DFD
Essex	ESX
Co Fermanagh	FMH
Fife	FFE
Mid Glamorgan	GNM
South Glamorgan	GNS
West Glamorgan	GNW
Gloucester	GLR
Grampian	GRN
Guernsey	GUR
Gwent	GWT
Gwynedd	GDD
Hampshire	HPH
Hereford & Worcester	HWR
Hertfordshire	HFD
Highlands	HLD
North Humberside	HBN
South Humberside	HBS
Isle of Man	IOM
Isles of Scilly	IOS
Isle of Wight	IOW
Jersey	JER
Kent	KNT
Lancashire	LNH
Leicestershire	LEC
Lincolnshire	LCN
Greater London	LDN
Co Londonderry	LDR
Lothian	LTH
Greater Manchester	MCH
Merseyside	MSY
Norfolk	NOR
Northamptonshire	NHM
Northumberland	NLD
Nottinghamshire	NOT
Orkney	OKE
Oxfordshire	OFE
Powys	PWS
Shropshire	SPE
Serk	SRK
Shetland	SLD
Somerset	SOM
Staffordshire	SFD
Strathclyde	SCD
Suffolk	SFK
Surrey	SRY
East Sussex	SXE
West Sussex	SXW
Tayside	TYS
Tyne & Wear	TWR
Co Tyrone	TYR
Warwickshire	WKS
Western Isles	WIL
West Midlands	WMD
Wiltshire	WLT
North Yorkshire	YSN
South Yorkshire	YSS
West Yorkshire	YSW

21-28MHZ PHONE CONTEST 1990 NOTE (CHANGE OF RULES):

All entrants should note that there is a change in the format used for the multiplier in this event. The UK County Code replaces the previous UK Prefix and overseas entrants should calculate their multipliers on the number of different county codes received from UK stations.

TRANSMITTING SECTION

Eligible Entrants: This contest is open to amateurs world-wide. UK entrants must be fully paid-up members of the RSGB.

1. Date and Times: Sunday 7 October 1990, 0700-1900 GMT (UTC).

2. Frequencies: 21150-21350kHz and 28450-29000kHz only.

Mode: Telephony only.

Sections: Single operator and Multi-operator. Single-operator entrants are those who receive no help of any kind during the contest. (The use of spotting nets, and similar prefix assistance is strictly forbidden.)

4. QSY (10 minute) Rule: An entrant who QSY's from one band to another and makes a scoring contact may not change bands again until at least 10 minutes have elapsed since the last scoring contact on the original band.

5. Exchange: RS report and serial number (commencing with 001). UK stations include their County Code in the exchange. Overseas stations contact British Isles stations only.

6. Scoring:

(i) QSO Points: 3 points for each completed contact on either band. (The same stations may be contacted on both bands for QSO points and Multipliers).

(ii) Multipliers: UK entrants: Each DXCC country or prefix per list shown at the end of these rules. Overseas entrants: Each UK county will count as a separate multiplier. A full list of the UK county codes is shown on this page.

(iii) Total Score: The number of QSO points on each band are added together. The total number of multipliers on each band are added together. The final score is the total QSO points multiplied by the total multipliers.

(iv) Duplicate Contacts: These must be clearly marked.

Unmarked duplicate contacts will be penalized at a rate of 10 times the QSO value in addition to the loss of the points for the contact. Entries containing more than five unmarked duplicate contacts will normally be excluded from the contest.

7. LOGS:

(i) Logsheet: To be to the IARU Region I (Brighton) format, (RSGB standard). These log sheets are headed: Date/Time (UTC), Callsign of station worked, RS and Serial No sent, RS and Serial No received, multiplier (if claimed), QSO points claimed. Every column must be completed for each contact and all contest exchanges must be recorded. (Overseas entrants must record the UK County Code received for the contact to count for points).

(ii) Band Logs: A separate log must be submitted for each band, together with

a list of the multipliers claimed for each band. Note: Overseas entrants can obtain a sample RSGB log and summary sheet, by sending an addressed envelope to RSGB at the address shown for receipt of logs (Rule 8).

(iii) Duplicate Sheets: Entrants making more than 80 contacts are asked to submit a 'Dupe' sheet for each band showing a list of the callsigns worked in alphabetical order and with either the serial no. sent or the time of the contact appearing beside each callsign. Dupe sheets listing the callsigns worked in QSO or random order are of no value to the adjudicator and entrants are asked to sort calls in an Alpha-Numerical format.

(iv) Summary Sheet/Declaration: Each entry must be accompanied by the following declaration: 'I declare that this station was operated strictly in accordance with the rules and spirit of the contest and within the terms of my licence. I further agree that the decision of the RSGB Council shall be final in all cases of dispute.' The sheet should also list the scores and the number of QSO's claimed for each band and the totals. UK entrants must further state 'I have no objection to the information from my log being entered into a computer for the sole purpose of the contest adjudication'. All entrants must state the Section (Single, Multiple Operator or Receiving) that they are entering.

8. Closing Date for logs: Logs from UK entrants must be postmarked on or before 5 November 1990. Overseas entries must be received by 3 December 1990. All Logs to be sent to RSGB HFCC, PO Box 73, Lichfield, Staffs, England.

9. Awards:

UK Single-operator Section: The overall UK winner will receive the Whitworth Trophy with Certificates of Merit to the second and third placed entrants. The Powditch Transmitting Trophy will be awarded to the entrant with the highest score on 28MHz.

Multi-operator Sections: A Certificate of Merit to the highest placed Group in each section.

Overseas Single-operator Section: Certificates of merit will be awarded to the three leading entrants.

Subject to the decision of the RSGB HF Contests Committee, additional certificates will be awarded to the leading entrant from each country, provided that a score of at least 50 per cent of that of the overseas winner is achieved.

RECEIVING SECTION

Rules as for Transmitting Section except as varied below:

Eligible Entrants: Any SWL, (UK entrants must be fully paid up members of the RSGB).

Scoring: UK SWL's may only log Overseas stations in contact with UK stations and Overseas SWLs may only log UK stations in contact with overseas stations. The same callsign may only appear once in every three contacts being logged, except when the station 'heard' provides a new multiplier.

Logs: Separate log for each band. Log sheets to be headed: Date/Time GMT, Call of station heard, call of station being worked, RS and serial no sent by station heard, multiplier (if new), points claimed. A summary sheet is required for each band showing the points and multipliers claimed. Each log must be accompanied by the following Declaration: 'I declare that this station was operated within the rules and spirit of the contest and that I do not hold a licence to transmit on frequencies below 30MHz. I further agree that the decision of the RSGB Council shall be final in all cases of dispute. UK entrants should also state 'I have no objection to the information from my log being entered into a computer for the sole purpose of the contest adjudication'.

Awards: The Metcall Trophy will be awarded to the leading UK entrant. The Powditch Receiving Trophy will be awarded to the leading British Isles entrant on 28MHz (subject to there being a minimum of 5 entrants on this band). Certificates of Merit to the stations being placed second and third in the British Isles and to the three leading overseas entrants.

MULTIPLIERS FOR UK ENTRANTS

Each DXCC country, except UK countries. For contacts with Australia, Canada, Japan, New Zealand and USA, each district counts as a separate multiplier, eg JA1 (or JF1 etc), W1 (or N1, K1, KA1 etc).

RULES FOR LOW POWER FIELD DAY 1990

Please note the altered contest exchange under Rule 7.

1. Aims: This contest is intended to encourage portable HF operation using QRP CW rigs powered by batteries or natural power sources.

2. Guidelines: The Guidelines for HF Contests, published in January 1990 RadCom, page 66, will apply.

3. When: Sunday 15 July 1990, 0900-1200 and 1300-1600 GMT.

4. Sections: (A) 10W RF output maximum. (B) 3W RF output maximum. All entrants must be RSGB members resident in the British Isles, and single- or multi-operator entries are permitted.

5. Frequencies: 3510-3560kHz and 7010-7040kHz, CW only. Both bands may be used during each session, and UK or foreign QRP or QRO stations may be contacted for points. A given station may be contacted once on each band for points.

6. Special conditions:

(i) The power for all parts of the station must be derived from batteries or natural sources such as solar cells or wind driven generators. Float charging batteries from petrol, gas or diesel driven generators is not permitted.

(ii) The transmitter or outboard PA must not be capable of RF output power in excess of 15W.

(iii) Antennas must not exceed 35 feet (10.66m) above ground level and should have no more than 2 elevated support points. Permanent buildings or structures (other than trees) may not be used as support points for antennas.

(iv) The station must not be sited in a permanent building.

7. Exchange: RST, serial number, county code and RF output power in Watts. Serial numbers commence at 001 and continue through both sessions. County codes are shown on page 67 (foreign participants will not send county codes). Output power should be expressed as one or two digits plus 'W' in place of the decimal point, e.g. '10W', '1W', '1W5' (1.5W), '0W1' (100mW). Participants using more than 10W may send 'QRO' instead [QRO stations may not actually enter the contest but may 'give away points'].

8. Scoring: Score 15 points for each contact with another QRP Portable or Mobile station, 10 points for each contact with a QRP Fixed station and 5 points for all other contacts. For the purposes of scoring, 'QRP stations' are defined as those using no more than 10W RF output power.

9. Documentation: Standard RSGB HF Contest Log Sheets (HFC1) should be used, although computer-printed logs are acceptable provided they follow the same format (i.e. same column order, 40 contacts per page). Received county codes and RF output powers should be recorded in Column 5. Use separate sheets for each band. Duplicates must be clearly marked in the log and no points may be claimed (unmarked duplicates will be penalised at the rate of 10 times number of points claimed). An HF Summary Sheet (HFC2), with station and operator details and a signed declaration, must accompany every entry.

10. Address for entries: logs and checklogs should be sent to "HFCC c/o Dr G. Hinson, G4IFB, 41 Beechen Lane, Lower Kingswood, Surrey KT20 6RY" postmarked before 31 July 1990.

11. Awards: The Houston-Fergus Trophy will be awarded to the leading entrant in section A, and the Southgate Trophy to the winner of section B. Certificates will be sent to the first 3 entrants in each section and to the QRP Fixed station submitting a checklog giving the most points to QRP Portable stations.

MESSAGE FROM THE VHFCC CHAIRMAN.

I would like to thank all those clubs, societies and individuals who have written to me with regard to Rule 16, VHF Field Day, or in fact any other matter regarding VHF contests, whether for or against changes mooted. It seems that if I ask you the readers to comment on some of the items printed (albeit a little tongue in cheek), that it does have the desired effect, you write to me. Please continue to make your thoughts known to me or any member of the VHFCC. We do read your letters, and if possible we do try to implement the more useful ideas.

My thanks also go to all those who showed an interest in joining the committee, I have taken on a few more members both full and corresponding, it is possible that a few more may be required but those that have already applied will be on the "short list".

A complete list of VHFCC members is as follows: Full Members.

G4DEZ	Chairman	G4PIQ new
G4UJS	Secretary	G8HHI
G4JLG		G8TFI
G4WAD		G8XVJ new

G4OUT also on VHF committee.

Corresponding Members

GM8MJV	G2HIF
GI4KIS	

BRS32525 Bob Treacher

G6LX HF Contests Chairman

G3UBX VHF Committee Chairman

The VHFCC members are all keen contesters, their ages range from early 20's through middle aged (me) to real OM's like Cliff G2HIF who have been contesting since I was a lad! The aims of the VHFCC are to adjudicate fairly any VHF/UHF/SHF contest sponsored or controlled by RSGB, and to rely not on those who feel that to "win" or do well in a contest requires the use of excessive power.

Bryn Llewellyn G4DEZ
VHFCC Chairman.

LOST POINTS IN VHF/UHF/SHF CONTESTS

If contesters wish, an "MQT" certificate can be provided by the adjudicator to show where points are lost in your entry. We hope that this may be of use to contesters whether new or old to the game, if required please send SAE and mark "MQT" required on the cover sheet. G4DEZ.

432MHZ CW CONTEST

10 June, 0900-1700 GMT

Three sections: S Single Operator; M Multi-operator; L SWL.

General rules apply (but see above).

All entries to G4DEZ 110 South Avenue, Southend, Essex, SS24HU.

432MHZ FM CONTEST

10 June, 0900-1200 GMT

By popular demand!!!

Two sections: L SWL; O All others.

General rules apply (but see above).

All entries to G4DEZ (as above).

144MHZ LOW POWER

28 July, 1500-2300 GMT

Three sections: L SWL; O Multi-operator; S Single operator

General rules apply (but see above, also remember rule 16).

County and Country multipliers will be used.

Output power at the transmitter 25W PEP maximum.

All entries to G4OUT QTHR.

432MHZ LOW POWER

29 July, 0900-1500 GMT

Three sections: L SWL; S Single operator; M Multi-operator

General rules apply (but see above, also remember rule 16).

County and Country multipliers will be used.

Output power at the transmitter 10W PEP maximum.

All entries to G4PIQ QTHR.

RESULTS

2ND 1.8MHZ CONTEST 1989 RESULTS

The popularity of this contest remains high and the HFCC is pleased to report an increase in UK entries. This appears to be despite the hardships suffered in the form of poor propagation coupled with high general band noise. To quote one entrant "First ever operation on 1.8MHz. Noisiest band I've ever heard, I take my hat off to 160M contesters for their determination." As in the 1st 1989 event, UA9 stations were noticeable by their absence and the only DX activity from the west was VE1ZZ's appearance in one log. Whatever happened to the opening to stateside that used to perk up the last hour?

It is encouraging to note the efforts made by an increasing number of entrants to make their antennas more efficient. Dipoles with apex heights varying from 60 to 90 feet were used at several stations and one entrant had even utilised his local church steeple. There was a spread of standard transceiver equipment, the main requirement being tight skirt selectivity and good close-in dynamic range. A 500Hz filter is a must and the additional receiver facilities provided by modern equipment are most useful when the going gets tough.

The winner of the Victor Desmond Trophy this year is Chris Burbanks, G3SJJ, and in second place is new entrant, Vic Lindgren, G4BYG. Top Scottish entrant is Barry Beggs, GM3YEH, again a welcome newcomer to this event, with possibly an eye on lifting the Mailland Trophy.

When a member of the HFCC is scheduled to adjudicate a contest he has entered and appears to be in an award-winning position, it is customary for the checking to be carried out by a sub-committee. The

procedure was of course adopted for this event.

As usual for the 1.8MHz series of contests, logs were well presented with the exception of a few un-marked duplicates which crept in.

H.F.C.C.

BRITISH ISLES SECTION

Posn	Callsign	Valid QSOs	Bonus QSOs	Total Points
1	G3SJJ '	176	64	837
2	G4BYG '	157	60	768
3	GW4IOI¶ '	147	62	748
4	G3OLB	134	58	692
5	G3TBK	127	57	655
6	GM3YEH	116	57	630
7	.G4BUE	120	55	603
8	G4HTD	114	52	601
9	G2MJ	99	52	555
10	G3ZGC/P	105	47	549
11	GM3RAO	87	50	510
12	G3SQX	83	43	463
13	G4OGB	83	41	454
14	G3KZR	80	43	453
15	G3MCX	74	44	441
16	G3VYI	77	42	440
17	G4CP/P	83	38	438
18	G3YLG	78	41	437
19	G0JNZ	76	42	435
20	G3LET	81	38	427
21	G4ERW	75	40	424
22	G5MY	72	40	414
23	GM3UM	69	41	412
24	G3TXF	73	36	406
25	GW3JI	62	37	369
26	GM3NCS	86	45	355
27	G4ARI	81	33	347
28	G4BOU	59	34	346
29	G4CZB	55	35	340
30	G3GLL	56	34	336
31	G4HUP	53	33	318
32	G2HLU	54	30	312
33	G4BK!'P	49	31	300
34	G3HKO	47	31	296
35	G3SKC	44	31	287
36	G3FVW	41	32	276
37	G3NKS	40	31	275
38	G3ZRZ	43	32	259
39	G4EBK	41	26	253
40	G3LIK	36	26	237
41	GM4OBK	32	24	192
42	G3UNM	20	19	149
43	G4IFB	17	13	116
44	GW4KVJ	11	9	78

OVERSEAS SECTION

Posn	Callsign	Valid QSOs	Bonus QSOs	Total Points
1	DL5JQ '	62	35	360
2	DL8BAV	45	29	275
3	OK1DRO	40	27	251
4	OK1KYY	38	26	239
5	DJ3ZX	33	25	219
6	EI5FK	41	23	207
7	DL1ZO	30	22	168
8	LY3BO	18	17	130
9	UC2CBR	20	17	126
10	LA1IE	15	13	109
11	OL1BVR	14	12	100
12	UV3AFB	12	12	85
13	OL7BTG	11	8	71
14	OK2PCN	9	6	49

' = Certificate winner.
¶ = (GW3NYY)

Checklogs gratefully received from GM3PFQ, G3BPM, UZ3DWX, UC2LDW, UC2LB, UA4YBV, UB5-075-145.

21 MHz CW CONTEST 1989 RESULTS

Conditions were reported down for this year's event. This was reflected in the scores and was undoubtedly responsible for the falling-off in the number of DX entries received (particularly from JA and VK/ZL). Support from Europe continued its increase, and most notable was the booming popularity of the QRP sections, entries for which were almost double the number received in 1988.

Once again Ron Stone GW3YDX heads the field — is there anyone out there who can beat this man? Congratulations to Phil Catterall GM4OBK who takes the runner-up position in his first-ever event from a new country (especially since his antenna system was completed only days before the event) and to Al Slater G3FXB, this year relegated to third place. In the QRP section G4BK! triumphed by the narrowest of margins over G4EDG, with G4ELZ in third place.

The standard of logs received was (as appears the rule for this contest) very good, with almost all the UK entrants including a full checklist in alphabetical order, which helps the checking enormously. There were some problems with the scoring system, particularly among the newer entrants, of whom several will find that their scores have dramatically *increased* and the LY prefix was missed as a new multiplier by quite a number. The adjudicator feels that a special mention is due to Dave Lawley G4BUO, whose log could not be faulted and was the highest-placed (5th overall) of a goodly number of error-free entries.

There were several comments from overseas stations regarding the lack of UK multipliers available — indeed. GD, GI, GJ, GU — where were you? Accordingly the multiplier system for the 1990 event will, as an experiment, be based on the UK counties list. Comments on the changes (or the rules in general) are always welcomed.

G3UFY

UK TRANSMITTING QRO

Posn	Call	QSOs	Mults	Fnl Score
1	GW3YDX+	738	85	180965
2	GM4OBK'	685	84	171276
3	G3FXB'	578	86	151868
4	G3LET	564	87	145551
5	G4BUO	565	83	140685
6	G3RTE	572	80	137040
7	G3TXF	561	81	135999
8	G3NKS	551	80	132240
9	G3KDB	548	80	131520
10	GM3YOR	555	77	128205
11	G3TBK	512	79	121344
12	G4ODV/P	490	77	113190
13	G0IVZ	448	77	103488
14	G3GLL	427	74	94794
15	GM3YEH	428	66	84744
16	G3VYI	388	72	83592
17	G0JFX/P	384	72	82944
18	G3SWH	356	69	73692
19	G4KGK	355	67	71355
20	GM3CFS	332	70	69720
21	G5MY	329	65	63960
22	GW3HGJ	359	66	63954
23	G3LHJ	347	62	62310
24	G3KZJ	320	64	61440
25	G4UZN	309	66	61182
26	G3OLU	334	64	60864
27	G3MPB	307	60	55260
28	G2QT	284	62	52824
29	G4DQW	278	63	52542
30	G4LZB	273	62	50778
31	G4XRX	259	62	47802
32	G3ESF	244	63	46116
33	G0CEU/P	269	54	43578
34	G3NKG	275	55	43230
35	G2AFV	243	58	42282
36	G4OOT	238	54	38340
37	G4RO1	237	53	37683
38	G4IOM	216	53	34344
39	G0LII	223	48	32112
40	G0CGV	187	51	28611
41	G0FKX	182	50	27150
42	G3AWR	149	51	22797
43	G4ZYN	151	37	16761
44	G4HZV	131	41	15990
45	G4PTE	115	39	13455
46	G3WRR	94	40	11160
47	G4ZME	83	36	6856
48	G0KJV	78	29	6786
49	G2HDR	63	29	5481
50	G4OKN	62	27	5022
51	G0KJN	59	20	3540
52	G6NK	45	24	3528

UK TRANSMITTING ORP

1	G4BKI'	316	63	59724
2	G4EDG'	301	64	57792
3	G4ELZ'	228	60	41040
4	G4ARI	234	51	35802
5	G0GWA	161	43	20769
6	G4VPM	160	41	19434
7	G4EC1	171	40	19320
8	G2HLU	149	41	18327
9	G3HJF	121	40	14520
10	G4WUS	125	36	12960
11	GW3SB	109	36	11664
12	G0HGA	131	28	9828
13	G4SXE	105	31	9765
14	G3FZG	32	16	1538

OVERSEAS TRANSMITTING QRO

1	LZ1KXA'	185	16	8688
2	LZ2AP'	152	17	7582
3	LZ2AX'	161	14	6762
4	UT5UGR'	161	14	6636
5	VE7CC'	141	15	6345
6	5N2I/G3GJQ'	147	14	6174
7	LY2BZ'	145	14	6090
8	RB5QW	144	14	6006
9	UZ1TWB'	148	13	5772
10	UA6HPW	140	14	5712
11=	LZ1KVZ	151	12	5364
	UA1NBR	149	12	5364
13	K5MM/7'	126	14	5292
14=	NM2Y	143	12	5148
	N4AR	132	13	5148
16	EA8AB'	137	12	4932
17	K3ZO	135	12	4824
18	LZ2KAC	145	11	4785
19	JA7SN'	120	13	4680
20	UR1RXB'	140	11	4620
21	UR2QA	128	12	4608
22	UJ8JA'	117	13	4563
23	LZ1MG	160	11	4488
24	UA1AUA	123	12	4426
25	UB5FAN	135	11	4389
26	HA5AWH	136	11	4323
27	SM0BVQ	123	11	4059
28	UQ2GRX	118	11	3861
29	UZ3DWX	115	11	3762
30	OK1TW	117	11	3707
31	UA3QQB	110	11	3597
32	HA1SL	119	10	3570
33	RB4JF	120	10	3510
34	RA4A1	124	10	3450
35	HA2KSD	101	11	3333
36	YO9AGI	111	10	3320
37	W1DMD	110	10	3300
38	YO2GZ	97	11	3168
39	SP4GFG	106	10	3150
40	UA1OT	104	10	3120
41	LA4YW	102	10	3060
42	OH2PM	112	9	3024
43	OH3NM	100	10	3000
44	OK1MH1	98	10	2940
45	UZ1NWF	96	10	2880
46	RB5FT	93	10	2790
47	LA9DFA	103	9	2781
48	UZ6AXO	98	10	2760
49=	K2SX/1	90	10	2700
	HA5LZ	100	9	2700
51	UB5LKW	99	9	2673
52	UB7VA	97	9	2619
53	K2PS	85	10	2550
54	YV1OB'	85	10	2510
55	OK2PDT	93	9	2502
56	RZ9UA	75	11	2475
57	OK3CSO	85	10	2460
58	OK3CWF	105	9	2430
59	K7ZA	80	10	2400
60	UA1WBV	86	9	2376
61	JA9CWJ	71	11	2343
62	HA8ZO	115	10	2340
63	HA5KKC	77	10	2310
64	OK1FIM	76	10	2300
65	UA0QGB	76	10	2270
66	UY5TE	75	10	2240
67	SM5BDY	81	9	2187
68	LY2FF	80	9	2160
69	UA4PMX	65	11	2145
70	Y41BE	71	10	2120
71	SM5IMO	70	10	2100
72	YU7SF	75	9	2025
73	UB0QZ	61	11	2013
74	RT5UE	66	10	1980
75=	JA7YAA	64	10	1920
	SM5DEV	85	8	1920
77=	JA7KM	63	10	1890
	UC2OL	70	9	1890
79	VO8AW	69	9	1854
80	UW9YY	68	9	1836
81	Y31EM	61	10	1830
82	YO3RK	72	9	1773
83	OK1KZ	65	9	1728
84	RA3TDS	65	10	1720
85=	YO5BAT	64	9	1701
	OH7NVU	63	9	1701
87	JP1DMX/NIB	62	9	1674
88	HG0D	65	10	1650
89	UA9XC	61	9	1647
90	OK2BBQ	75	7	1575
91=	IK1GPH	53	10	1560
	SM0DSF	52	10	1560
93	OK2KMR	57	9	1539
94	LY2BDC	57	9	1512
95	DL1OO	60	8	1440
96	JA1IRH	47	10	1410
97	YO7BGA	70	7	1386
98=	LZ2TF	49	9	1323
	OK2ABU	63	7	1323
	UL8RWR	49	9	1323
101	W1CNU	48	9	1296
102	YB2FEA	46	9	1242
103	EA7ALG	48	8	1128
104	UB5LGM	40	9	1080
105	UL7RER	41	9	1071
106	JA8CJY	39	9	1053
107	SM6UF	60	6	990
108	Y31NJ	37	9	972
109	LZ1CW	40	8	960
110=	JA1JGP	35	9	945
	UA9MX	45	7	945
112	JA2EJI	43	7	903
113	UQ2GRZ	38	8	888
114	JA4ETH	32	9	864
115	UA3TAM	41	7	861
116	SP6FBD	40	7	840
117	OK2KVI	39	7	798
118	Y23HJ	29	9	783
119	JA5IP	36	7	735
120=	LB7FC	30	8	720
	OK1KCF	30	8	720
122	PY1AJK	29	8	696
123=	JA9RYL	28	8	672
	DF2UU	28	8	672
125	Y71KA	45	5	660
126	W8XT	27	6	632
127	HA9PB	30	7	623
128	OK3CXS	24	9	621
129	OH6GZ	29	7	609
130	Y25OF/A	25	8	600
131	N4UOH	25	8	584
132	UA9CGL	27	7	567
133	VK4XW'	21	8	504
134	JA3ARM	21	8	480
135=	JA3UWB	22	7	462
	LZ1KKR	22	7	462
137	UZ6LU	25	8	450
138=	DL1ZO	25	6	414
	UA9LBY	23	6	414
140	DF2HL	21	6	378
141	OZ1FAO	25	5	375
142	PA62CHM	15	8	344
143	OK1AII	15	7	315
144	CN8FC	17	6	306
145	JA2FNY/1	15	6	252
146	JF7UNG	13	5	195
147	JH9EIT/1	12	5	170
148	HA5MY	4	3	36

OVERSEAS TRANSMITTING ORP

1	LZ1TD'	108	10	3140
2	UQ2GFU'	112	9	3024
3	UA9FGJ'	90	10	2700
4	UA3DPX	88	10	2640
5	SM0BYD	87	10	2610
6	G0AEV/CT1	95	9	2565
7	EA1GT	79	10	2390
8	OK1NR	85	9	2295
9	RA1ODK	80	9	2160
10	RV9CFP	75	9	2025
11	OE1AKB	54	11	1782
12	YO6ADW	65	9	1755
13	JR7OMD/2	59	10	1700
14	UV6LIP	68	8	1632
15	Y23TL	60	9	1512
16=	OK1HR	62	8	1488
	OK2SBJ	64	8	1488
18	OK1DRE	53	9	1431
19	SM6HVR	54	9	1377
20	OK1MZO	38	10	1110
21	UF6QBA	35	6	1050
22	OK1IOA	44	6	1032
23	VE3HX	38	6	912
24	EA1CYL	29	7	588
25	JF8LPB	20	8	480
26	JA8RJE	13	4	144

UK RECEIVING

1	BRS1066'	165	53	26235

OVERSEAS RECEIVING

1	LZ1M-333'	158	14	6636
2	UA1-143-1'	117	12	4212
3	OK3-28612	90	10	2700
4	LZ2K-308	72	12	2592
5	UA9-090-601	70	11	2310
6	OZ-DR-2044	43	8	1032
7	LZ2K-434	38	9	1026
8	¶LA 566	26	8	624
9	UA0-98-34	24	7	504

Disallowed: OK2-939 (repeat "Station being worked" rule).

CHECKLOGS received with thanks from:

HACK G0CKP G4FDC GM4SID GW3JI LA6FC N0GOS OK1US OZ1JLX SM7HEC UA3EDH UA4UDC UA4YG UA4YZ UA9AKS UA9XS UB4JIF UB5XBV UC2AIDR UP3BA Y21UC Y27DL

+ Trophy winner
' Certificate winner

19B9 432 MHZ CUMULATIVE CONTEST RESULTS

The 1989 Cumulatives were well supported by the regular 432 MHz operators, and every competing station was active for all four sessions. Nobody said they wanted 5 sessions, however. Activity in the North was reported higher than expected, that in the South lower. The remedy for low activity is of course in the hands of the reader, but it is a pity that more amateurs do not use this enjoyable and well-disciplined band. In fact, between 90 and 130 stations were active during sessions 1,2 and 4 and almost 200 in session 3, so that most people only work a small proportion of the active stations. Perhaps we expect 432 MHz to behave like 144 MHz in every respect. Session 3 gave excellent till conditions to some SW stations, G8NEY/P expressed amazement at making 101 contacts, but the further N and E you were, the worse conditions became. G4NTY and G1NXS in IO83 didn't notice the lift at all, and GD6ICR found only high band noise, despite making a much higher score than in the other sessions. The rules confuse most stations, judging from the varied paperwork which accompanied the logs. Producing clear rules has obviously defeated the committee. Can anyone suggest how to improve matters? It is of paramount importance if we are to increase support for contests. Congratulations to GD6ICR, the winner of the fixed station section, and to G8NEY and G4GCM (G8NEY/P), the winners of the "All Others" section. Congratulations also to G4JNZ, the runner- up in the fixed section. All will receive certificates. Thanks also to all stations who took part, increasing the enjoyment for everybody.

G4JLG

SINGLE OPERATOR SECTION.

POS	CALL	SCORE	LOC	ANT	DB(W)	13th	29th	14th	30th	BEST DX
1	GD6ICR	3000	74PF	21	20	401	338	636	390	523
2	G4JNZ	2513	91LC	21	26	303	281	456	361	575
3	G6HKM	2014	01FT	23	20	256	224	517	335	461
4	G4NPH	1872	028I	4X17	18	194	217	405	231	509
5	G4DEZ	1745	01IN	18	17	188	225	194	238	468
6	G4ERG	1451	93SR	21	23	197	159	267	191	734
7	G4NTY	1186	83TM	21	20	155	136	187	155	354
8	GI HLT	948	93KD	48	15	134	82	236	81	265
9	G4LDR	800	91CD	17	17	138	70	4	97	422
10	GI NXS	743	83RK	17	14	197	82	107	107	303
11	G3JJZ	525	01AN	19	14	33	89	105	72	430
12	G0FKY	508	80XS	21	15	26	41	99	90	607
13	G7ODT	179	83XN	19	10	4	9	35	38	189

ALL OTHER STATIONS SECTION.

POS	CALL	SCORE	LOC	ANT	DB(W)	13th	29th	14th	30th	BEST DX
1	G8NEY/P	3000	80WX	2X21	20	371	251	1241	489	820
2	GW0MGR/P	2449	83JA	2X19	17	251	288	917	347	768
3	GI LII	827	91RD	4X8	15	48	87	265	152	581

DECEMBER 1989 70MHZ CW CONTEST

The CW contest on 70MHz took place in December in average conditions for the time of year. Several stations commented on increased activity for the mode of operation.

EI9FK was plagued with local electrical noise and hence despite being best DX for several stations, must have lost a few high scoring QSO's in the last hour of operation. Combining that with logging errors on three contacts cost him the first place, which went to GW4BVY/P. Congratulations to those two stations as certificate winners, and also to all other participating stations who braved the 8am start. We will try to put it back one hour next year as per your requests.

G8HHI

POS	CALLSIGN	SCORE	QSO'S	LOC	BEST DX	KM
1	GW4BVY/P	243	36	IO81NV	GM4OIJ	451
2	EI9FK/P	236	21	IO63WC	G3MPN	490
3	G3UKV	175	30	IO82RR	GM4DIJ	359
4	G3JYP	151	19	IO84SN	G3BPM	420
5	G5RS/P	154	28	IO91TF	EI9FK/P	443
6	G3TCU	114	18	IO91QE	EI9FK/P	432
7	G3LVP	111	23	IO81WV	EI9FK/P	240
8	G3BPM	84	13	IO80OW	G3APY	266
9	G4OUT	83	17	IO92AT	EI9FK/P	280
10	G3NKS	50	12	IO81XU	G3JYP	302
11	G5UM	28	7	IO92MP	EI9FK/P	350
12	G4AGO	15	5	IO91OF	GW4BVY/P	161

Checklog gratefully received from GW4ALG.

RSGB NATIONAL DF FINAL 19B9

The 1989 DF National Final took place on a bright sunny Sunday afternoon on 24 September. 18 competing teams took part, comprising 17 qualifiers from the 8 regional events plus last year's national champion who has automatic right to defend his title.

The event was organised on behalf of the RSGB by the Coventry ARS and was covered by the Leicester & Coventry Ordnance Survey map. The start was near the centre of the map at Burbage Common and Wood. Most teams contained a full complement of four, some of whom were friends who had not manged to qualify in their own right. This meant that some very experienced and formidable teams were competing which gave the organisers plenty of work to do to make the event difficult.

Station 'A', G4MDF/P, was located approximately 14km south of the start, on a disused railway embankment, north-west of the village of Draycott. There was a considerable length of aerial wire running along the railway track with several 'legs' taken off to confuse the competitors. One of these 'legs' ran under a very narrow muddy culvert and ended up at a voice-operated tape recorder. This cunning little device was designed to entice the poor competitor up the culvert thinking he was talking to the transmitter operator. All went well for the first 3/4 hour, much to the amusement of the transmitter operator who was near the other end of the culvert and could hear every unmentionable word when the penny finally dropped. However, the tape eventually ran out so later competitors missed out on this little diversion. First in was Colin Metcalfe but it was some time before the rest of the competitors managed to locate the transmitter. One competitor who shall remain nameless took well over an hour to find the station, and by the look of him any adrenalin he had at the start had long gone.

Station 'B', G4CFG/P, was located very close to the start on the southern edge of Burbage Wood. The operator made use of the wire fence running round the perimeter of the wood as the aerial. The tx power was attenuated by experiment to give the right signal strength at the start. A piece of wire was used to join two parts of the fence where a footbridge crossed the boundary of the wood. This was very carefully concealed so that competitors walking over the bridge could not see it but could hear a crashing signal when the transmitter was on. Chris Plummer was first in at this station followed very closely by Dave Holland.

Station 'C', G4KZU/P, was hidden approximately 8km north of the start in a wood, south-west of Newbold Verdon. Approximately 1km of the wire was strung in and around the wood to give the competitors plenty to think about. This proved very successful with competitors thrashing about the wood for some considerable time. The station was hidden under some fallen trees and, with the help of an assistant, the 'hide' was well camouflaged. Trevor Gage was the first in here, but in the process of getting his form signed, other competitors spotted him and several came in seconds afterwards. The unfortunate operator then had the unenviable task of trying to fill in several forms and the check log all at the same time. There is nothing like the enthusiasm of some competitors to keep the operator on his toes.

A total of 56 exhausted competitors and team members sat down to tea at the Coventry ARS HQ where Alan Bennett on behalf of the RSGB, presented the winner, Alan Simmons, with the RSGB trophy. The winner and second placed competitor, Chris Plummer, then gave graphic accounts of their afternoon's escapades and thanked the Society for organising the event and the XYLs for preparing the tea.

Afterwards, Mike Hawkins presented George Wheatham with the Bert Simmonds Memorial Rose Bowl, which is awarded to the competitor who has gained the most points during the eight qualifying rounds; points being awarded in the 'grand prix' format.

RESULTS OF BERT SIMMONDS MEMORIAL ROSE BOWL

POSITION		CLUB	POINTS
1.	G Wheatland	Coventry	28
2.	T Gage	Mid-Thames	25
=	B Bristow	Mid-Thames	25
4.	C Plummer	South Manchester	16
5.	A Collett	Chelmsford	13
6.	A Simmons	Mid-Thames	11
7.	D Holland	South Manchester	9
=	G Foster	Stratford	9
=	P Clark	Chelmsford	9
=	M Hawkins	Chelmsford	9
11	C Wells	South Manchester	7
12.	B Poole	Mid-Thames	6
=	P Cunningham	RSGB	6
14.	I Butson	Colchester	5
=	P Lisle	Mid-Thames	5
=	D Newman	Northampton	5
17.	M Standen	Mid-Thames	4
18.	C Merry	Dartford Heath	3
19.	A Mead	RSGB	2
20.	I Morrison	South Manchester	1
=	W Pochey	Mid-Thames	1
=	P Latbalestier	Devizes	1

RESULTS OF NATIONAL FINAL

	POSITION	CLUB	TIME OF ARRIVAL Tx 'A'	Tx 'B'	Tx 'C'
1.	A Simmons	Mid-Thames	4.01.30	3.16.30	2.22.45
2.	C Plummer	South Manchester	4.15 00	3.15.30	2.20 00
3.	T Gage	Mid-Thames	4.16.00	3 23.00	2.17.45
4.	G Foster	Stratford	4.17.00	3.28.45	2.20.30
5.	M Hawkins	Chelmsford	4.17.30	3.16 45	2 21.00
6	P Clark	Chelmsford	2.35.00	3.17 45	4.17.45
7.	D Holland	South Manchester	4.18.30	3.15.45	2.18.30
=	D Newman	Northampton	2.32.15	3 23 45	4.18.30
9.	P Cunningham	RSGB	4.18.45	3.17.30	2.21.45
10.	B Bristow	Mid-Thames	4.19.00	3.16.30	2.22.15
11.	C Metcalfe	Mid-Thames	2 20.30	3.17.15	4.22.15
12.	M Standen	Mid-Thames	2.31.30	3.41.45	4.22.30
13.	A Collett	Chelmsford	4.26.30	3.16.45	2 20.45
14	C Wells	South Manchester	2.32 00	3.42.00	-
15.	C Merry	Dartford Heath	2.35.15	3.57.30	-
16.	P Lisle	Mid-Thames	2.31.00	-	4.03.45
17.	B Poole	Mid-Thames	3.24.30	4.24.30	-
18.	A Mead	RSGB	-	-	3.18.15

50MHZ CW CONTEST, DECEMBER 9TH, 19B9, RESULTS.

Unfortunately, the address for logs was printed incorrectly in the rules and this may have lead to some logs going astray. Apologies to anyone who has been left out of the table as a consequence – Ed.

Conditions for this contest were average to flat, the timing of it carefully avoiding the end of an opening to W/VE! Activity during the contest was very low, several contestants commenting that they weren't sure they were operating on the right night. One contact in the first hour was not unusual.

It is obvious that people have forgotten what this band was like before the rise in sun activy reduced it to the squalor of the HF bands. One contestant commented on the number of operators working either on or close to the nominal frequency for DX working.

If this contest is run again, consideration may be given to selecting an operating zone way from this frequency. GM4AFF had a very frustrating time, being able to hear many southern stations but unable to raise them.

Congratulations go to the two certificate winners, G3XBY as leading fixed single-op and GW4UJS/P as leading all other station. Thanks to them and all the others who made the effort.

G4WAD

POSN	CALLSIGN	PTS	QSOs	LOC	PWR	ANT	BEST DX	KM
1	GW4UJS/P	348	44	83JA	8	6Y	G3YYF	—
2	GW4BVY/	344	50	81NV	10	2X5Y	GM3WOJ	—
3	G3XBY	266	50	92DG	10	4Y	PA3OYS	452
4	G5RS/P	256	40	91TF	6	6Y	GM3WOJ	765
5	G4BLX	244	38	90WV	20	5Y	G3UVR	338
6	G3UKV	237	38	82RR	10	5Y	GM3WOJ	569
7	G3KNU	97	17	93ON	20	2Q	G5RS/P	259
8	G4HUP	87	14	02PD	10	5Y	GW3MFY	340
9	G5UM	53	14	92MP	8	4Y	G4BLX	195
10	G1SMD	34	6	90AR	12	DIP	GW4UJS/P	286
11	GM4AFF	9	3	87VA	10	5Y	GM4XOJ	147

Check Log received with thanks from G3BPM

RSGB LISTENER CONTEST 90 RULES

OBJECT OF THE CONTEST

To log as many stations in QSO as possible. Operation is over 24 hours but only 18 hours may be operational during the 24 and a continuous 6-hour rest period clearly marked in the logs.

DATE AND TIMES

1200 gmt 7 July to 1200 gmt 8 July 1990.

SECTIONS AND BANDS

(a) SSB only

(b) CW only

Only one section may be entered - mixed-mode entries will not be accepted. The 28, 21, 14, 7, 3.5 and 1.8MHz bands may be used. Please note that entrants from the British Isles must be members of the RSGB.

SCORING

For scoring purposes the station logged must be in QSO with another amateur station. It does not matter whether the station is taking part in a contest or not. CQ, QRZ or similar calls cannot be counted for scoring. One point to be claimed for each station heard on each band. A multiplier may be claimed for each different country heard on each band. In the case of the USA, Canada, Australia, New Zealand and Japan, each call area numbered prefix may be claimed as a separate multiplier, for example: W1, W2, VE2, VE3, VK5, VK6 and so on. All other countries will be determined by the ARRL Countries List.

The final score is made up by the addition of the points scored on all bands multiplied by the total number of multipliers claimed on all bands.

LOGS

Logs should show in columns, time (gmt), callsign of station heard, callsign of station being worked, an RS(T) report on station heard at swl's QTH, multiplier (if any), points claimed. If both sides of a contact are heard, they may be claimed as separate stations, and the callsigns are to appear in the station heard column. Each station heard can only appear once in the station heard column on each band. In the column for station worked, a callsign must only appear once in every three contacts logged (1 in 3) unless it is a new multiplier for the receiving station. The same 'station worked' may not be used for more than three successive multipliers.

Logs should be submitted with each band listed on separate sheets, 28MHz on one sheet, 21MHz on another and so on. A separate sheet listing all multipliers for each band should also be included.

Duplicate loggings for which points have been claimed will be penalised at 10 times the correct value.

ADDRESS FOR ENTRIES

R A Treacher, BRS32525, 93 Elibank Road, Eltham, London SE9 1QJ, England. Entrants should ensure their entries are postmarked no later than 6 August 1990.

AWARDS

Certificates will be awarded to the leading three entrants in each section in the British Isles section provided there is a minimum of 10 entrants. A certificate will be awarded to the leading station in each country in the overseas section provided that station scores at least 50% of that section winner's score.

CONTESTS CALENDAR

RSGB HF CONTESTS

3 May	1st 28MHz Cumulative (Feb90)
11 May	1st 28MHz Cumulative (Feb90)
13 May	Salisbury DF (Apr 90)
19 May	County Roundup SSB (Mar 90)
20 May	County Roundup CW (Mar 90)
2,3 June	HF National Field Day (Feb90)
10 Jun	Mid-Thames DF (Apr 90)
23, 24 Jun	Summer 1.8MHz (Apr 90)
24 Jun	Banbury DF (Apr 90)
7, 8 Jul	SWL (May 90)
15 Jul	Low Power Field Day (May 90)
15 Jul	Ripon DF
29 Jul	Chelmsford DF
19 Aug	Coventry DF
26 Aug	ROPOCO 2
1, 2 Sept	SSB Field Day
9 Sept	Torbay DF
10 Sept	2nd 28MHz Cumulative
18 Sept	2nd 28MHz Cumulative
26 Sept	2nd 28MHz Cumulative
30 Sept	DF National Final
4 Oct	2nd 28MHz Cumulative
7 Oct	21/28MHz Phone Contest (May 90)
12 Oct	2nd 28MHz Cumulative
21 Oct	21MHz CW Contest (May 90)

RSGB VHF CONTESTS

5,6 May	432MHz Trophy & SWL (Apr 90)
5,6 May	434MHz to 24GHz (Apr 90)
6 May	10GHz Cumulatives (Jan 88)
19,20 May	144MHz & SWL (Apr 90)
10 Jun	10GHz Cumulatives (Jan 88)
10 Jun	432MHz CW Single/Multi/SWL (May 90)
10 Jun	432MHz FM Fixed & Open (May 90)
7,8 Jul	VHF Field Day (Apr 90)
22 Jul	10GHz Cumulatives (Jan 88)
28 Jul	144MHz Low Power/SWL (May 90)
29 Jul	432MHz Low Power/SWL (May 90)
All Aug	432MHz Activity
12 Aug	1·3 & 2·3GHz Trophies
19 Aug	10GHz Cumulatives
All Sep	1296MHz Activity
1,2 Sep	144MHz Trophy/SWL
9 Sept	10GHz Cumulatives
16 Sep	70MHz Trophy/SWL
30 Sep	50MHz CW
6,7 Oct	432MHz - 24GHz SWL & IARU
7 Oct	10GHz Cumulatives
9 Oct	1·3 & 2·3GHz Cumulatives
17 Oct	432MHz Cumulatives
21 Oct	70MHz CW
25 Oct	1·3 & 2·3GHz Cumulatives
2 Nov	432MHz Cumulatives
3,4 Nov	432MHz CW 8-hr Marconi-RSGB
10 Nov	1·3 & 2·3GHz Cumulatives
2 Dec	144MHz AFS-Fixed/SWL
4 Dec	432MHz Cumulatives

There will be an SWL section in every VHF contest even if not mentioned in rules

OTHER CONTESTS

First Tuesday each month
144MHz Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)

First Thursday each month
432MHz Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)

First Monday each month
Microwave Scandinavian VHF/UHF/SHF Activity Contest (Jan89 VHF/UHF)

Dates of publication of rules in *RadCom* are shown in parentheses

The New Cirkit Summer Catalogue

- 100s new products
- £10 worth discount vouchers
- Latest books
- Low cost multimeters
- 184 pages
- Only £1.60 available from larger newsagents or directly from Cirkit

Cirkit Distribution Ltd.
Park Lane, Broxbourne, Herts EN10 7NQ
Telephone (0992) 444111

OUT NOW! OUT NOW! OUT NOW!

Bredhurst electronics

RSGB

BREDHURST ELECTRONICS LTD.
High St, Handcross, W. Sx. RH17 6BW
(0444) 400786

SITUATED AT SOUTHERN END OF M23 — EASY ACCESS TO M25 AND SOUTH LONDON

HF TRANSCEIVERS

TS950S	£1195.00
TS940s	£1995.00
TS440s	£1138.00
TS140s	£862.00
TS680s	£945.00
FT757GX2	£960.00
FT767GX	£1500.00
FT747GX	£850.00
IC765	£2400.00
IC751A	£1500.00
IC735	£978.00
IC725	£759.00
IC726	£969.00

ANTENNA TUNER UNITS

FRT 7700	£59.00
FC757AT	£349.00
AT 230	£208.00
AT 250	£366.00
IC AT 100	£379.00
MFJ 941D	£195.00
MFJ 949C	£158.00

MORSE KEYS

Kent Morse key kits	£33.50	2.50
Kent Twin-paddle kits	£42.50	2.50
HI Mound MK704	£20.00	2.00
HI Mound HK706	£22.00	2.00
Vibroplex original std	£81.79	2.50
Vibroplex lambic std	£77.98	2.50
Bencher BY2 Chrome base	£76.67	2.50

POWER SUPPLIES

BNOS 12/5E	£74.75	5.00
BBNOS 12/20E	£178.25	5.00
DRAE 6 amp	£84.99	3.00
DRAE 12 amp	£113.10	5.00
DRAE 24 amp	£163.42	5.00

2M TRANSCEIVERS

TH25E	£238.00
TH205E	£199.00
TH215E	£228.00
TS711E	£898.00
TR751E	£599.00
TM231E	£299.00
FT411 + FNB10	£255.00
FT290R II	£429.00
FT211RH	£309.00
FT212RH	£348.00
IC2CE	£265.00
IC290D	£559.00
IC228H	£365.00
IC275E Inc PSU	£1005.00
IC2SE	£275.00
IC2SET	£295.99

70cms TRANSCEIVERS

TS 811E	£998.00
TR 851E	£600.00
TH 405E	£245.00
TH 415E	£268.00
FT 790RII	£499.00
FT 711RH	£349.00
FT 712RH	£275.00
IC 4CE	£299.00
IC4SE	£310.00
IC 448E	£429.00

FILTERS

AKO HPF1	£6.75	1.00
AKO Braid Breaker	£6.75	1.00
AKO Notch Filter	£7.75	1.00
BNOS Low pass filter 6m	£26.95	1.50
LF30A Low pass filter	£32.26	2.00

DUAL BAND TRANSCEIVERS

TM 721E	£599.00
TS 790E	£1495.00
FT470R + FNB10	£429.50
FT736R	£1358.00
FT 4700RH	£875.00
IC 32E	£299.00
IC 3210E	£499.00
IC 2400E	£835.00
IC2500E	£875.00

RECEIVERS

HF225	£395.00
ICR71	£855.00
R2000	£595.00
VC10 VHF Converter	£161.00
FRG8800	£648.00
FRV8800 VHF Converter	£100.00
RS000	£875.00

SCANNING RECEIVERS

IC R7000	£986.00
FRG 9600M	£599.00
RZ1	£465.00
AR 2002	£487.00
R 535-Airband	£240.00
Standard AX700E	£575.00

FAIRMATE HP100E
Ultimate pocket scanner
★ 1000 channels
★ 25-550 & 830-1300 MHz
★ AM, FM & wideband FM
NEW
£299

ANTENNA RANGE

J Beam 'Minimax' — Tribander	£378.35
J Beam TB3 MK3 — Tribander	£385.70
Butternut HF6VX	£182.85
Butternut HF2V	£183.30
Cushcraft A3 Tribander	£299.00
Cushcraft 2M 215WB	£99.00
Tonna 20805 5 ele 50mhz	£50.72
Tonna 20809 9 ele 144mhz	£33.12
G Whip tribander, 10,15 & 20M	£44.39

PALOMAR ANTENNA PRODUCTS

Antenna Noise Bridge ++ up to 100 mHz	£50.95
Tuner — Tune your ATU without transmitting	£99.08
L.E.D. S.W.R. Meter — Auto S.W.R. up to 2kW p.e.p.	£124.95
9:1 Balun for the T2FD Antenna	£23.05

CO-AXIAL SWITCHES

SA450 2 way SO239	£19.40	1.50
SA450N 2 way N	£26.99	1.50
Diae 3 way SO239	£20.16	1.50
Diae 3 way N	£29.11	1.50
CS4 4 way BNC	£30.39	1.50
MFJ-1701 6 way SO239	£30.72	1.50

ANTENNA BITS

HI-Q Balun 1:1 5kW PEP	£10.95	1.50
Bricomm Balun 4:1 1kW	£14.05	1.50
Bricomm 7.1 MHz Epoxy Traps (pair)	£12.85	1.50
Self Amalgamating Tape 10M x 25MM	£4.25	0.75
T-piece polyprop Dipole centre	£1.00	0.25
Small ceramic egg insulators	£0.85	0.20
Large ceramic egg insulators	£0.85	0.20

CABLES ETC

URM 67 low loss coax 50 ohm per metre	£0.95	0.25
UR 76 50 ohm coax dia. 5mm per metre	£0.35	0.10
UR 70 70 ohm coax per metre	£0.35	0.10
UR 95 50 ohm coax dia. 2.3mm per metre	£0.40	0.10
4mm Polyester Guy Rope (400kg) per meter	£0.25	0.10
50mtrs. 16 swg hard drawn copper wire	£10.95	2.00
75 ohm Twin Feeder Light Duty per metre	£0.25	0.10
300 ohm Slotted Ribbon Cable per metre	£0.32	0.10

GOODS NORMALLY DESPATCHED WITHIN 24HRS PRICES CORRECT AT TIME OF GOING TO PRESS — E&OE MAIL ORDER & RETAIL

BREDHURST ELECTRONICS LTD, HIGH ST, HANDCROSS, W. SUSSEX RH17 6BW (0444) 400786
Open Mon-Fri 9am-5pm except Wed 9am-12.30pm. Sat 10am-4pm

USED EQUIPMENT SALE.....

All guaranteed for 90 days — includes carriage

YAESU FT75R Tcvr	£199
TONYO NT120 14MNz Tcvr	£199
ICOM IC4E Tcvr + Acc	£125
FILTERS for TS940S	£99
FTC 740R 4m Tcvr	£72
BNOS 25a Power Supply	£197
YAESU FTV 901R Transverter	£270
YAESU FT101 Tcvr & Speech Clipper	£240
ICOM 791A NF Tcvr	£1444
YAESU FT20SR 2m Nondheld Tcvr	£115
YAESU FT729/9m Tcvr	£529
YAESU FT811	£199
CN& 1001 ATU	£105
ICOM R7000 Receiver	£959
ICOM R71E Receiver	£575
ICOM IC25SE 2m Tcvr	£125
NRA 7	£69
YAESU FT208R Tcvr	£125
NENWOOD TS940S Tcvr	£1599
KENWOOD TS940S Tcvr	£1599
ALINCO ELN 24E	£299
YAESU FRC E900 Receiver	£529
YAESU FT 200R Tcvr/MMB	£219
YAESU FT 290R Tcvr/MMB	£219
BNOS linear 144/10 LPN & preamp	£99
MICROWAVE Modules 452/50 Linear & preamp	£99
OATONC SRB2 Auto Notch Filter	£57
YAESU FTV107R Transverter (frame only)	£45
MICROWAVE Modules Transverter Multimode 50/28S	£195
ICOM AT100 Antenna Tuner	£247
YAESU FT9010M Transceiver	£445
NENWOOD TS550 Spkr, ext VFO,9 NC 90	£925
TANOY 1000 Computer & Colour Monitor	£590
TEN TEC Century 21 N.F Tcvr	£199
REALISTIC PRO 2001 Scanner	£125
STANOARO CS800 VHF all mode Tcvr	£299
ICS FAX 1 with printer	£299
YAESU FT75R 70cms Nondheld	£199
ICS Amtor 2 all mode terminal	£11E
MICROWAVE Modules 2m pre-amp	£15
YAESU FT 207R 70cms Nondheld	£80
TRIO 5500 UNF Nondheld/ plus Keypad entry	£148
IC 751E HF Tcvr all mode	£929
NENWOOD MC85 Microphone	£59
ASTRO 105HF Tcvr & PSU	£479
SMC PSU 50a	£119
ADONIS AM505C Microphone	£55
TRIO TR9000 Recviver	£249
ICOM IC211E	£270
YAESU FT208R	£150
SAISHO Recviver	£79
YAESU FC102 A.T.U	£155
YAESU FC700 A.T.U	£95
TONO HC800 Printer	£99
YAESU FT797CX with Em	£885

CHECK BY TELEPHONE BEFORE ORDERING
LIST CORRECT AT GOING TO PRESS

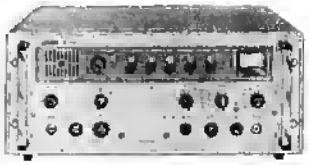
AMCOMM

373 Uxbridge Road, London W3 9RN 01 992 5765
Fax: 01 992 5767 Telex: 24263

AH ELECTRONICS

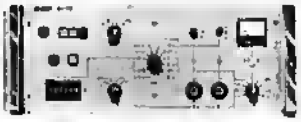
Est. over 20 years

RACAL RA1771 PROFESSIONAL COMMUNICATIONS RECEIVERS


RA1771

Covering 15KHz to 30MHz in 10Hz steps, tuning is via 6 decade rotary switches for MHz, KHz & Hz, fully synthesized from internal standard. Modes USB/LSB, CW, AM, Bandwidths 300Hz. 1KHz, 2.7KHz (SSB) 8KHz, fitted internal speaker, and 'S' meter, further spec on request. These receivers have never been used and are as new and tested before despatch.
Call and see us for a demonstration of this superb receiver, supplied with 3 manuals but no cabinet.
PRICE £675.00, carriage £20.00

RACAL MA1720 TRANSMITTER DRIVE UNITS


MA1720

Frequency coverage 1 to 30MHz tunable via 6 thumbwheel switches to within 100Hz. Modes — USB/LSB (A3A A3J) compatible AM (A3H) MCW (A2H, A2J, in USB or LSB), CW (A2J in LSB).
Power output adjustable 25mW to 200mW into 50 ohms, unwanted sideband suppression -50dB. AC Mains input. Size 178mm high, 483 mm wide, 508mm deep. This is the matching drive unit to the above receiver. Again these have not been used. Supplied in as new condition and tested. Other spec on request.
PRICE £495.00 with manual, carriage £20.00

REDIFON 1000 WATT LINEAR AMPLIFIER

All solid state unit requires 100mW drive for full output. Frequency coverage 1.5 to 30MHz. This is a free standing unit weight approx 110kg, this includes power supplies, aerial filter and amplifier. Provision to take the above Racal drive unit, with manuals, a giveaway at **£650.000**, buyer to collect.

RACAL RA17 Mk2 COMMUNICATIONS RECEIVERS


RA17

Frequency 500KHz to 30MHz, further spec on request, supplied in good condition and tested with 3 months warranty, buyer to collect by arrangement.
PRICE £260.00 (no cabinet)

SCOTCH 224DP HI-FI ¼" recording tape 1,200ft on 5" spools in library boxes, new unopened boxes **£2.00** ea. (p/p £1.00 up to 5 off), **box of 10 £19.00** post paid.

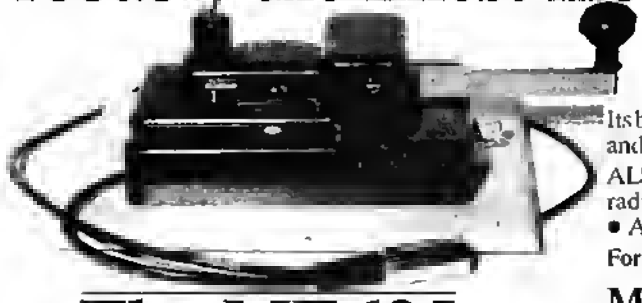
WANTED WW2 RADIOS for my own private collection. SPY SETS — 'A' Mk 2, B1, B2, AR11, etc. Command Rx's, BC453, 454, 455, + control boxes etc, 19 set Mk 1, Mk 2, BC312, BC342, etc, W.H.Y. Top price paid

CALL 0788 76473

151A BILTON ROAD, RUGBY, WARWICKSHIRE CV22 7AS

Shop open Monday-Saturday 9.30-1pm, 2.30-5pm. Closed Wednesday.

Probably the finest morse key in the world!



Now you can buy the ME605 Professional Morse Key, previously only available to Government Agencies and Defence Contractors.

Its balance and feel is incomparable. Thousands in use by training and operational personnel worldwide.

ALSO AVAILABLE: Professional headsets • Morse training/ radio procedure trainers • Morse encoders/decoders • Accessories • full 'custom' manufacturing.

For full details and prices call Carol or Nikki on 0442 890890.

The ME605

MORSE EQUIPMENT LIMITED

70-80 Akeman Street, Tring, Herts HP23 6AJ, United Kingdom
Tel: 0442 890890 Fax: 0442 891155 Telex: 83262 BATECO G

EASTERN COMMUNICATIONS

NEW PREMISES NOW OPEN.

We are proud to announce the opening of our new showrooms and offices at Cavendish House, Happisburgh. Try the latest equipment in comfortable surroundings, with full demonstration facilities. Set in open countryside, within minutes of the Norfolk Broads and North Norfolk Coast. Ample parking facilities, free from traffic wardens. We look forward to welcoming you.
Phone Fred, G4HXK, now - for special launch offers.

IC-24ET Dual Band
FM Handportable

KENWOOD YAESU ICOM

JAYBEAM - MICROWAVE MODULES - DEE COMM - S.E.M. - CAP.CO - BNOS - KENT - LOWE - DATONG - AKD - JUPITER - ICS - DAIWA

VISA

0692-650077

FIRST CLASS MAIL ORDER SERVICE FOR U.K. & OVERSEAS

CAVENDISH HOUSE, HAPPISBURGH, NORFOLK, NR12 ORU

ARE COMMUNICATIONS
THE SHOP WITH THE SMILE —

NOW AVAILABLE FROM ARE COMMUNICATIONS

KENWOOD TS 140 S HF TRANSCEIVER
USUAL LIST PRICE **£862**
OUR PRICE £699
OR £23.49 FOR 48 MTHS

KENWOOD TS 140 S

WE HAVE BEEN FORTUNATE IN PURCHASING A LARGE QUANTITY OF YAESU FT 747 TRANSCEIVERS DIRECT FROM OUR AGENT IN JAPAN AND WE ARE PLEASED TO BE ABLE TO OFFER THESE AT THE AMAZING PRICE OF

£499 INC VAT

CW & AM FILTERS ARE AVAILABLE AT £35 EACH

AVAILABLE WITH NO DEPOSIT AND 48 MONTHS TO PAY — £16.77 PER MONTH
(SUBJECT TO STATUS) APR 29%

THE FT747 HF TRANSCEIVER SSB/CW/AM (AND OPTIONAL FM) 100 WATTS PEP OUTPUT ON ALL HF BANDS AND GENERAL COVERAGE ON RECEIVE. 100kHz—30MHz, DUAL VFO 20 MEMORIES. ALTOGETHER A SUPER ECONOMICAL HF TRANSCEIVER.

Opening Hours Monday-Friday 9.30 to 5.30
NOW OPEN SATURDAY MORNINGS 10.00–1pm
LICENSED CREDIT BROKERS

ARE Communications Limited, 6 Royal Parade, Hanger Lane, Ealing, London W5A 1ET, England
Tel: 081-997 4476 Fax: 081-991 2565

VISA

SOUTHEND & DISTRICT RADIO SOCIETY announce their

1990 SOUTHEND RALLY

SUNDAY, JUNE 3th. 10.00-5pm

Rocheway Centre, Rocheway, Rochford, Essex

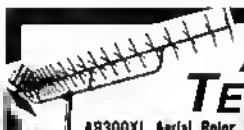
THERE WILL BE SOMETHING FOR EVERYONE SO BRING THE FAMILY

★ Bring and Buy ★ RSGB Books on Sale ★ Fancy Goods
★ Trade Stalls ★ Fun and Games for Children ★ Bar
★ Snacks Available ★ And Many Other Attractions ★ Armed Services Hospitality

(Ample on-site parking) Talk-in on S22

Further details contact John G0DFE on 0702 202216

Entry by programme £1, obtainable on the day



AERIAL TECHNIQUES

11 Kent Road, Perkstone, Poole, Dorset BH12 2EH. Tel: 0202 738232

AR300XL Aerial Rotor, Control Unit and Alignment Bearing

Rotor unit type AR300XL and control consol. Continuous indication of beam heading. Clamps to 2" (52mm) max. mast and takes 1½" (38mm) max. stub mast, 'Offset' type mounting. Vertical load carrying 45kg. Special offer £39.95 plus £2.95 p&p.
AR1203 Alignment (support) bearing Allows greater/higher head loads. Fitted above rotor. £18.10.

DX TV Monitor/Rxs and Video Recorders

Full range of mono/colour dual/multi-standard and VHF and UHF sets with sound channel switching. Also VHF/UHF — PAL/SECAM/NTSC recorders

Send 75p for our PRO/AM catalogue

Plus full range of Revco Discones, air/marine antennas, rotators and all aerial hardware.

Iron Powder and Ferrite

TOROIDAL CORES

Shielding Beads, Split Beads & Bars
Ferrite Rods; Baluns, Etc.

Send 50p for Full Details & Technical Data Catalogue.

FERROMAGNETICS

P.O. BOX 577 MOLD CLWYD, NORTH WALES CH7 1AH

SPECTRUM OWNERS

NO MORE WAITING FOR PROGRAMMES TO LOAD, SWITCH ON AND YOUR PROGRAMME IS READY TO USE!!

We are now able to supply our Spectrum programmes on Eprom, together with a suitable Eprom loader board and all hardware housed in one unit. The many advantages are too numerous to mention here. Please contact us for full details. An sae would be appreciated.

NOW available for **all** versions of the Spectrum

For further details of other products, send a sae or see earlier advertisements.

J.B.P. ELECTRONICS LTD.

Unit 45, Meadowmill Estate, Dixon Street, Kidderminster DY10 1HH
Telephone: (0562) 753893

TENNAMAST FOR TILTOVERS

GM60AL and GM4VHZ

Our wind up, tiltover Tennamasts are ideal for HF and VHF beams. Designed and professionally built by amateurs for amateurs, they are safe and easy to use, slim, elegant and economically priced from £190. Immediate delivery.

BEAM KITS Homebrew your own GM4UTP 5 Band Quad or VK2ABO Beam with our low cost kits.

Call **05055 3824** (24 hours) for Brochure and Info plus friendly technical advice

TENNAMAST SCOTLAND
81 Mains Road, Beith, Ayrshire KA15 2HT

Packet Radio. A new name, an innovative product.

RLC-100 4 port Packet Radio Controller, for the IBM PC and compatibles **£289**

A new product for the Radio Amateur from a leading UK commercial communications company - Thor Electronic Systems.

Features:- High Quality 2/3 length 8 bit PC card; 4 Independent radio ports; High spec modem devices; Up to 4 cards (16 ports) per PC; 12 Months warranty; 4 Modem disconnect headers

Ideal for Network Nodes, Mailboxes or multi-channel working. Includes latest version of BPQ, W0RLI, terminal and 'auto-configuration' software. Please call or write for further information. Other products include G4FAT Complete Station Logbook for the PC, second-user, reconditioned PC components, with 3 month guarantee.

Lion Systems Ltd, Lion House, 56 Lowesmoor, Worcester, WR1 2SE
Tel (0905) 24180 Fax (0905) 24721

NUNSFIELD HOUSE AMATEUR RADIO GROUP PRESENT THE TWENTY-FIRST

ELVASTON CASTLE

MOBILE RADIO RALLY

SUNDAY 10th JUNE 1990

ATTRACTIONS INCLUDE: Over 130 Trade Stands • Technical Bookstall • Grand Bring & Buy Stall • Flea Market • Craft Marquee • A Military Exhibit • Grand 21st Anniversary Prize Draw sponsored by Traders • DTI Exhibit • Arena Attractions throughout the day • Children's Entertainments and stalls • Full on-site catering • Talk-in on 144 and 432 MHz • Venue and car parking made available by permission of Derbyshire County Council. Car parking £1, coaches £2.

ADMISSION TO RALLY ACTIVITIES IS FREE

Further details: John Robson G4PZY 31 Melton Avenue, Littleover, Derby. Tel: Derby (0332) 767994
Peter Neal G3WFU. Tel: Derby (0332) 700265 evenings or club HQ on Derby (0332) 755900 – answering machine

ELVASTON CASTLE IS LOCATED 5 MILES SOUTH-EAST OF DERBY ON THE B5010

Dunstable Downs Radio Club
Present the 7th
National Amateur Radio

CAR BOOT SALE

FORMERLY HELD IN SEPTEMBER AT SHUTTLEWORTH

Sunday 20th May
10 am until 5 pm
Car parking £1 to charity
To Be Held at

A great day out for the whole family

Floral gardens, Amusements, Various Displays, Craft Museum, Music And much more

Bargains for everyone, or have your own stall.

Computers, TV, RTTY,Transmitters, Receivers, Microwave Aerials, Components, Satellite

Over 250 stalls last year.

Stockwood Park

Farley Hill entrance, Luton Nr M1 Jun 10

Run in conjunction with Rotary Club of Luton

Cost of plots

Private £7 in advance, £9 on day
Trade £20 large plot

Send cheques made payable to DDRC c/o 125 Telscombe Way Luton LU2 8QP

Please enclose S.A.E. other enquiries to Wendy 0582 451057

HAM RADIO

International HAM RADIO exhibition including the 41st DARC Lake of Constance meeting.

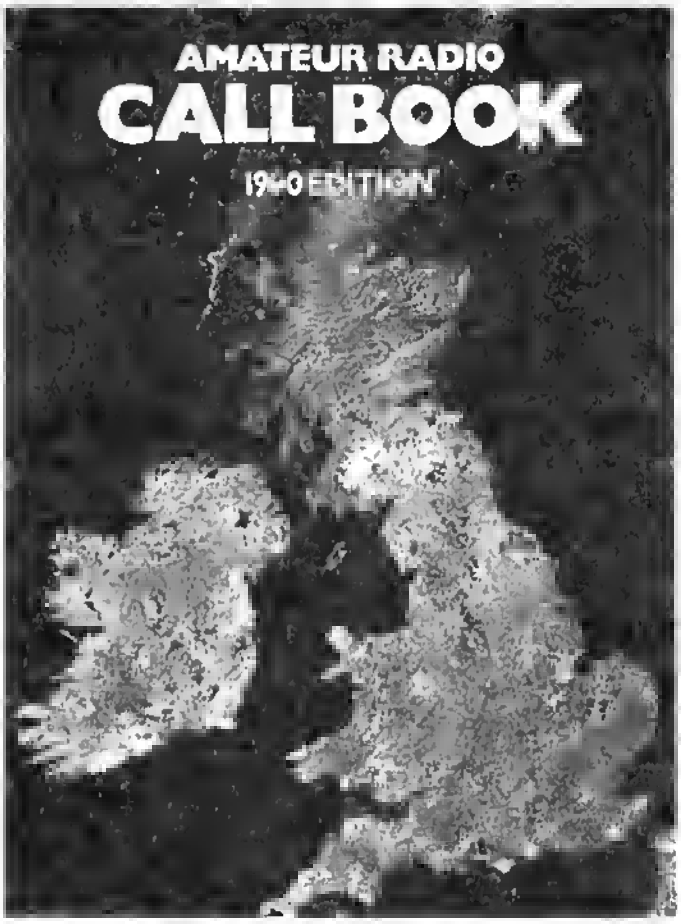
29.6.-1.7.1990

Friedrichshaten Exhibition Grounds
Fri. and Sat., 9 – 18^{00}, Sun. 9 – 16^{00}

Europe's top meeting place for HAM RADIO enthusiasts with the very best on offer from the radio, electronic and microelectronic sectors. Over 130 exhibitors and visitors from over 30 countries.
HAM RADIO 90 – an experience not to be missed!

ORDER NOW!

The 1990
CALL BOOK
and Information Directory



AND INFORMATION DIRECTORY

is now available from RSGB

Members Postal Price: £8.46

Non-members Postal Price: £9.95

Order from RSGB Sales (CWO),
Lambda House, Cranborne Road, Potters Bar, Herts. EN6 3JE,
or telephone 0707-59015 (24 hours) for credit card orders.

Members' Ads

Conditions of acceptance are published on the Members' Ad order form inserted into the wrapper with every issue of *Radio Communication* posted to members. This form must be used when placing an advertisement; and please note that FOR SALE, WANTED and EXCHANGE advertisements must not be mixed on the same form. A new, more flexible, pricing scheme has been introduced. Details are on the form. Each advertisement must be accompanied by the correct remittance, as a credit card payment, cheque or postal order made payable to the Radio Society of Great Britain. Please note that because this is a subsidised service to members, no correspondence can be entered into.

FOR SALE

●BJ200 Mk2 h/held scanner: £100. Vince G8LLB. 01-531 0716 after 6pm.

●DRAGON 64 computer, as new. PSU Datacorder manuals, several books, spare keyboard: £55 the lot. Coalville 0530 36595 G0BJG.

●YAESU FT726R 2m 70cm HF and satellite modules DTMF mic, exc.cond: £775ono. BBC-B computer issue 7: £175. 6502 2nd processor: £55. Hard disk drive for BBC 10meg incl s/wara in separate case with PS and 80trk disk/ia drive: £150. Tektronix 545A scope and Marconi TF144 sig.gen. Free but must collect. G4TIO QTHR. Wore 0920 466516.

●TRIO TR9500 70cm all-mode: £325. AOR2001 scanner 25-512megs: £250. Yaesu FT707/FRG7 FM-board, new: £45. Change your 2m bandy into scanner MFJ31 3 cvtr fits between handy and duck: £25. Kenwood/Trio TS430S FM filters AM.YK88A CW.YK88CN SSB.YK88SN SSB.YK88S: £650. Major 588 11m SSB/AM/FM: £75. Multimeter V-AC-DC-ohm, USA made, heavy duty steel case, ideal service work: £25. Konwood SMC25 spkr/mic: £25. Yaesu YM36 noise cancelling mobile mic: £25. Commercial grade 70cm glass fibre enclosed collinears, length 3m gain 6dBD: £35. Norfolk 0328 710641 G4VDC.

●ICOM 23cm all-mode IC1271 70cm/23cm masthead preamps. Norfolk 0328 710641 G4VDC.

●OTH sale, 3-bed bungalow, Exc order, Built 1960, modern kitchen, bathroom, 2 toilets. Gas CH, d/glazed. Large garage w/shop, pit, pwr, Gdns, 1/3 acre plus. Tarmac drive, quiet cul-de-sac. Gala into forest, Nr bus stop, shops 3/4 mile, 6 miles Bournemouth: £130,000. G3FK QTHR. Ferndown, Dorset 0202 873175.

●ROTATOR TR44: £100. 4X250B and base: £15. Osker dual reading swr/pwr meter 3.5-150MHz: £45. KW 100W 50ohm dummy load: £18. 2x 587BLY: £5. Clrkt 2W broad-band PA unit: £8. Clrkt SSB xtal filter and carrier xtals: £10. R5 4MHz freq. display: £15. UR67 16m new: £9. All mast 13ftx2m: £13. 19ftx2in: £19. 10ftx1.5in: £10. Stand-off brackets 16in: £6. Buyer collects larger items. Tho rast carr.extra. G4BWW QTHR. Southport 0704 29036.

●TR751E 2m tcvr with 6A pwr unit. Both 7mths old, as new: £500 with manual, Sudbury, Suffolk 0787 73238 G6DKE.

●YAESU FT980 HF tcvr: £500. Datong VLF cvtr: £10, 6m cvtr: £10. Lar linear omni match: £10. Yaesu YD148 mic: £15. VHF cavity wavemeter: £20. Yaesu FP12 PSU: Offers. AMTI terminal unit: Offers. G4HVK, St.Ives, Cornwall 0736 795946.

●TRIO TS820 tilted digital display. HF tcvr with mic, good cond: £375. Manual incl. 14ele 2m yagi: £15. G0LSS QTHR Bishops Stortford 0279 870903.

●YAESU FT290R Mutak, spkr mic, 1/4 wava, s/case, boxad. As new: £250ono. Homebrew 40ft tower: £150ono. 3ele 10m yagi, rotator: £65, May exch WHY, Yorkshire 0422 351 852 G0KTM.

●6-METRE LOG periodic yagi engineered to high standard. Power gain 12dB and F/B 24dB claimed. Exc performance worldwide, 8-ele inc 5-driven on 18ft boom (9' sections for transport). Impedance about 75ohms. £40 - a small fraction of commercial prices. Buyer collects. Also Revco "Old Reliable" KW antenna traps in good cond, pair KW40, KW20. £28 the lot or £15 pair +postage. G0MDZ. QTHR, Nr Southwell, Notts. Tel: 0636-830005

● PRO-30 h/held scanning RX with rechargeable batts and chgr: £80. 16mem AM/FM. G3UYK QTHR. (Winchester) 0962 67819

● AR88 good cond: Offers. Spares and manual incl. (Cheshunt,Herts) 0992 28110

● INDIVIDUALLY designed del house, gas CH, partial DG, porch, hall, guests cloakroom. 2 reception rooms, part fitted kitchen, rear lobby with CH boiler leading to radio shack. Upstairs 3 beds, bathroom, landing. Outside 150ft rear gdn, greenhouse, garage, parking for several vehicles/caravan. Good radio location WAB Square SP29 Staffs. Comes c/w all ants, Located in the middle of good motorway network approx 2 miles from Jct 10 M42: £89,950. Further details G0FXL QTHR. (Tamworth) 0827 281095

● ATARI 520ST computer, Atari SM124HD monitor. Kam data all mode. IC2402m trans HF5 vert GP + radial kit Western DX32 2ele beam pene trator 3-band. Offers. Buyers collect. G4GYW QTHR. (Todmorden) 0706 814562

● VALVES Centronics 5728. New, boxed: £30ea. G3LBG QTHR. (Torquay) 0803 313318

●AMSTRAD CPC464 computer with green screen monitor, 2 disk drives with interface and Amstrad V21/23 modem and interface: £300ono. Patrick Forbes. (Hitchin, Herts) 046276 483

● 50MHZ tvtr. Mean design with 10m I/F, SW. Well built, nice box. Worked VE1 etc: £70. Mike, G4SZX not QTHR. (Thorne) 0405 813713

● COMMODORE 128D c/w manuals and some s/ware: Offers. AR900UK handie scanner, boxed, hardly used: £145. Consider exch either or both for FP707, FC707, FV707DM. G4ATA not QTHR. (Huddersfield) after 6.30pm 0484 865772 or daytime 0484 722168

● YAESU FT208 h/held 2m tcvr with spkr/mic, chrgr, case, car lead, manual: £125ono. Akai 4-track reel-to-reel recorder: £195. Incl 5 11 in tapes, VGC. Sommerkamp 150W TX FL200B: £60. Realistic 4-track stereo mic mixer: £15. Avo model 8, pointar bent, hence: £25. G3HRN. (Newport, Shropshire) 0952 811168

● FREE standing 32ft Heathkit tower with dedicated ladder, both galvanised and painted green plus AR40 rotator with control box and cable: £250. Will split, offers considered. Buyer inspects and collects, but help given with dismantling. G3WNT QTHR. (Birmingham) 021-445 1405

● TS711E 2m base all-mode. Good cond: £600. Adonis 503 base mic: £25. All orig.boxes and manuals. G1KJT QTHR. (Milton Keynes) 029671 3124

● TEKTRONIX 1908 constant amplitude sig gen: £80. Solartron CD711S-2 scope (large, buyar collects): £40. Hamgear PMIBX active ATU: £15. Ex-Gov't directional couplers (as seen at rallies): £30o. Radio/cassettes; JVC (Derby): £40. Panasonic (gr.eq): £40. Sharp (cassette search feature) £40. Aldis 2-slide 300W projector (prof collected): £18. General shack clearance. SAE for lists. G8YBF QTHR or messages 061-477 5303 not QTHR

● ICOM 735 HF tcvr with gen.cov RX. Absolutely mint. 8mths old. Used v.little, c/w mic, box: £790ono G4ABF QTHR. (Southampton) 0703 791049

● TELEPRINTER, Creed model 444, 2 baud rates, manual and lectern. Exc.cond: Offers. Ben Allen. (Mmnhead) 0984 40576

● HT150 SSB/CW 80m tcvr 10W PEP CW filter fitted: £180. David Thomas, G4OGW QTHR. (Hereford) 098987 287

● TS430S, SP430, PS430, FM unit, MC60A, SSB/AM/CW filter units fitted. Little used: £685. GM4USY QTHR. (Newport-on-Tay) 0382 543082 after 6pm

● JAPAN Radio Co NSO 505 TX and NRO 505 RX. This superbly engineered equip will last a lifatima and is appreciating in value: £1850. Morries, G4GEN QTHR. (Nutley) 08257 2205

● UHF Duplexer Airtech M450-5A 5.5MHz spacing: £25. Tail T311/02 CBS repeater panel 16ch: £480. Exc.order. P.W.Brown, 33A March Rd. Wimlington, March, Cambs. PE15 0RW.

● ALTRON minibeam for 6-10-15-20m. Exc.cond 11mths old: £85. Genuine reason for sale. (Portsmouth) 0705 814939

● MUTEK tvtr 9-band HF 144MHz input 10W out: £320. Video recorder, remote control, front loading: £150. G4RRA. (Aldershot) 331617

● ALTRON AQ6-3E HF minibeam, 10-15-20-8, incl spare spokes, balun, worked VK. VGC: £100. PSU Kingshill NTS505, twin 0-35VDC 10A with sense outputs. Easy parallel operation, eg used for 12V/20A, c/w h/book: £80. Prefer buyer collects. G3ZTZ QTHR. (Camberley) 0276 25430

● QTH 2miles M5/42 chalet bungalow, Bromsgrove, Worcs. 2/3 beds, 2 toilets, bathroom, kitchen, pantry, utility, large south facing lounge bed-3/dinar. Purposa-built shack. All with full gas CH. Outside del garage and w/shop caravan and boat parking. In/out U-shaped driveway all within 1/5 acre. Hygain TH3 tribander supported on easily serviced structure. The setup has a worldwide track record. £95000 freehold. Further details from G4VZA QTHR. (Bromsgrova) 0527 579371

● TS520S with 10MHz CW filter, mic: £400. TS530SP with SSB/CW filters, mic: £600. ERA Microreader, early: £70. Daiwa Search 9 marine VHF RX 13V: £25. Belcom 13.8V/8A PSU: £7.50. Radcom binders 11 off: £5. SWM binders 9off: £5. Both 1970s size. FRA7700 active aarial: £30. ATU SST-T2 200W 10-80m small: £15. Icom HPI phones: £10. Collect or carr extra. G4IOT QTHR. (Folkestone) 0303 276063

● HF rig FT707 plus PSU: £500. FT208 plus desk top chrgr, hand mic, headset 0-30MHz R600 HF rcvr: £250. Morse key: £10. HF swr/pwr meter: £25. (Congleton) 0260 276496

● EDDYSTONE rcvrs 770R and EA12. Ext perfect but might need int cleaning and checking. Might deliver Yorks or Lincs. Chris (E. Yorks) 0482 631303

● BNOS PSU 12V/25A. £150. Trio 2300, c/case, mcads, chrgr, ong packing: £110. G0EUC QTHR. (Torksey, Lincoln) 042771 340

● YAESU FRG7 gen.cov rcvr. GWO and cond: £125. G4CSG QTHR. (Eastbourne) 0323 642465 6-7pm

● FRG7 gen cov RX with FM. Exc cond £150ono. 3ele 2m quad ant. £15. Buyar collects. G8XNG QTHR. (Swindon) 0993 537622

● BBC-B Watford DDFS, 32k shadow RAM and solderless sideways ROM board: £280. ISO Pascal: £35. May split. Ron G8WXP. (Carshalton) 01-642 6412

● COMPUTER ZX Spectrum + Ferguson data recorder, 30 games, CW TX/RX SSTV, RTTY G1FTU, G4IDE. VGC: £80ono. 144MHz 8ele yagi: £15. 13ele lonna: £15. Slim Jim: £5ono. G4SSX QTHR. (Ruislip) 0895 630527

● TM701E 2m/70cm T/RX: £365. AR950: £185. Signal R535, nicads, case etc: £235. All items boxed, manuals. VGC. Lockwood, G3XLL QTHR. (Mellis) 037983 596

● TRIO TS820 digital readout, revalved and aligned by Lowa: £375. Nick. (Mullion, Cornwall) 0326 241044

● YAESU FT73R UHF h/held, barr, case, CTCSS (FTS-12), DTMF (FTT-4), chrgr: £240ono. Pair Eimac 4CX350A: £45. Low-band Pye Westminster: £25. Prof band IV TV amp based on Mullard YD1300 triode (300W anode dissipation) 1/2 wava cavity design should tune 70cm: £75. Baby PC/XT mother board, with info: £40. Sony CDP-35 CD player: £100. B&W DM110 spkrs: £70. Sony SL-C9 Beta video (needs attn): Offers. Pye PF1A RX (real spkr) on SU18. Good cond: £18. Miko G8TIC, (Worcester) 0905 763476

● HEATHERLITE mobile mic with scanning control box: £20. Shura 444 desk mic: £25. Philips PM3233 10MHz double beam scope: £60. Toshiba valves, pair 6JS6C and 12B7A7: £30. OOVO640A: £15. OVO3-20A: £10. OOVO3-10: £5. Buyer collect or carr extra. G3OHC QTHR. (York) 0904 87779

● TRIO TS780 2m/70cm multimode basestation tcvr. Mains and DC cables, h/book, diplexer, boxed. Kenwood MC60A preamped mic. All in good cond. £650. Buyer to collect. G0GFR QTHR. (Poole) 0202 741939

● FT726R 70cm module for HF module FT726R. G1VXW QTHR. (Halesowen) 0384 65614

● RACAL 117E good cond: £250. SSB adaptor modified: £50. RA197 preselector: £50. MA79 drive unit: £50. G6XNC QTHR. (Bromley) 01-462 4461

● KENWOOD TS930S as new: £1200. G6AIO (Southampton) 0703 869995 day 0703 737892 after 6.30pm

● 3ELE trap beam Mosley TA33JR, 14-21-28MHz, with Kenrotor KR400RC heavy duty rotator and remota control and direction indicator. Manufacturers insts and specs for all items in good cond. Buyer collects. Real rack necessary. £230. G8WV QTHR. (Newport Pagnell) 0908 612604

● YAESU FT200 300W PEP tcvr SSB/CW/AM 3.5-30MHz with 240VAC spkr/PSU mint cond. H/book. Looks/size FT101. Use on air before you buy: £200. Protel desk mic SSB/FM/COMP: £20. Consider p/exch 2m TX. G3EAY, (Gt. Chesterford, Essex) 0799 30763

● SONY hi-fi separates, STJX2L stereo tuner, TCFX2 cassette deck, boxed: £110 or will split at: £60ea. G4STE QTHR. (Warwickshire) 0789 763855

● MARCONI standard sig.gen TF867. Magnificent lab inst with huge dial. Needs attn, hance: £25. Marconi Guardian ships rcvr (24V): £20. Taylor 45D valve tester: £10. Both GWO all with manuals. G3MFW. (St. Austell) 0726 73608

● TRIO HF SSB tcvr TS120S high pwr model 200W PEP. Good order: £450. G3BXI QTHR. (Trowbridge, Wilts) 0373 830804

● YAESU FT707, FP707, FV707DM. FC707 rack and m/mount. Shura 201 mic: £700. FT726R 2m/6m/70cm satellite unit, MDI mic: £950. MM100W linear 2m: £100. FTS01 with mom and WARC bands kit plus 757AT auto ATU. £750. Jim, G4XRU not QTHR. (Brighton) 0273 686694

● MILITARY radio UKPRC351 complete station USA clandestine radio complete station 2-30m/c manpack TRC300A complete station. Sensible offers for above. Rcvr 1475 with PSU 62set A41 with transistorised PSU orig. CPRC26 A40 68set pair PRC361 manpack radios Redifon GR479 2-12m/c SSB AM/CW 100W 19sets. Various PSUs/accs. Collector giving up. Mike. (Brighton) 0273 508573

● BLACK Jaguar MkIII scanner, case, chrgr, DC/DC PSU. Boxed, mint. Cond v. sensitive: £150. G0MZI. (Salisbury) 0722 337711 anytime

● FOR the collector working RME69 rcvr manual, spares. Also Sharp IT26H CCTV monitor and camera: Offers. GOGEO QTHR. 0535 663403

● KENWOOD SP94D matching extension spkr for TS940S. As new, boxed: £65. Kenwood HS5 deluxe phones. As new, boxed: £25. Kenwood MC43S up/down hand mic, brand new but no box: £12. G0EQL QTHR. (Cheshire) 0606 554857

● CAPCO magnetic loop ant 20-15-10m. Hardly used: £255. Datong auto RF speech processor: £65. FT101 Mk2 160-10m incl new bands with LLL speech processor and Shura mic: £315. FT221R 2m multimode tcvr with digital readout: £335. Buyer collects. Not QTHR. (Chichester, W Sussex) 0243 573308 eva

● TRIO TS830S. Perfect cond with 3 new valves extra: £475 cash. Strumech 60ft down to 20ft electric winch: £750 cash. Roobl 1200C colour slow scan: £775 cash. Robot 800C colour: £400. As a pair. Arthur C.Bevington G5KS. Phone 6-10pm

● TRIO TR7930 144MHz FM 25W tcvr: £155. National AGS F76 rcvr with 4 bandspread coils. Similar age and concept to HRO. Suit collector: Offers. Denis Jones. (Wirral) 051-652 7454 day 051-342 7680 eva

● ROBOT 450C SSTV scan cvtr: £550ono. G3WGM, (Stanmore) 01-954 4997

● KINGSHILL DC PSU 90-130V/5A: £50. 2 vintage STC mics model 4032A: £20. AKG D58/60 mic: £20. Zenith multiband short wave radio needs attn: £10. Metal flight case for Teac A3340: £25. Sony TC252D tape deck: £40. Claude Lyons auto voltage regulator 60A rating: £95. Two Colron B/W CCTV cameras with 25mm lenses: £50ea, 2 Hitachi 17m B/W monitors: £45ea. 5/8 magmount for 2m: £5. Sinclair ZX81 with manual: £20. Philips 290 pocket memo: £15. Sold due to punitive mortgage on QTHR. G6ALK QTHR. 0689 7735D

● YAESU FT200 HF tcvr incl mains PSU: £200. G3UGL QTHR. (Bedford) 0234 750050

● YAESU FRG7700 preamp: £25. Yaesu FRT7700 ATU: £30. Datong FL3 auto notch: £80. Datong morse tutor: £28. MMS2 morse tutor: £90. All with insts or manual. All + post. G0MWI. (Tamworth) 88-66874

● BNOS LPM 44-3-100 new, boxed with insts: £140. SP225 dual meter VSWR/pwr indicator, average/PEP, 1.8-200MHz with ext pwr sensor supplied. Mint cond, boxed with makers insts. 5W/15W/150W: £65. Both prices incl post. G1VCY QTHR. (Benfleet, Essex) 0268 753508

● MML432/50 linaar, new, boxed with insts: £80. SP420 2m/70cm VSWR mator 4/20/200W avarage/PEP, Boxed with insts: £35. G1VCY QTHR. (Benfleet, Essex) 0268 753508

● TRIO 9R-59DS HF rec: £40. GEC Konilworth LB 4m 2ch xtalled: £15. VDU/keyboard suit packet. Needs attn: £10. G0JKA QTHR. 0742 882748

● FT703R 70cm h/held, mini cond, boxed, spare nicad pack: £135. K2RIW 70cm PA: £190. PSU for K2RIW, 2200V/.5A: £175. DK10F 2m PA single 4CX250B: £45. Commarical 13.8V/10A linaar PSUs: £25. Chris, G4CRF not QTHR. 029871 4888

● PK232 Pakrall terminal unit with PC-Pakratt, PK-Fax s/ware, latest version 10/89, brand new, boxed: £225ono. Ravox MS1 station monitor scopa, new boxed: £210ono. Jaybeam VR3 triband vert 2kW 20/15/10: £45. DLI 000 1kW dummy load: £45. SSA PC boards part assy: £10. (Notts) 0602 609345

● FLAT rcol mount, for HF/VHF dish ants, specially designed and manufactured by Strumech. Heavy duty triangular lattice tripod, 5ft base footprint, H2R rotor head unull, KSO65 thrust bearing, galvanised, free-standing, 12ft height, drawing available. As new: Offers. (Notts) 0602 609345

● YAESU FT101E, CW filtar, DC pwr leads, good cond with manual and orig box: £300. Rupert. G4XRV QTHR. (Chesham,Bucks) 0494 783557

● USED reel-to-reel tapes from the 1960s. 3x7in, 10x6in, 8x5in, 4x3in. Make me an offer. GM0AAX QTHR. (Kilmarnock) 0563 21987

● CHEAP to good home. FT107M 13.8V DC HF tcvr. VGC. Prof modified to add 18+10MHz bands. Plus Racal RA17, filted cover, working order but suspect IF valve. Both units c/w manuals, diagrams, spares lists: £250 the lot. No splits, buyer collects. G3UZN QTHR. (N.Norfolk) D26371 3238 up to 8pm

● YAESU FL2100Z linear 10-160m, exc.cond. £550. G4PYA QTHR. (Whitstable) 022779 3250

● YAESU FT227R FM 2m tvtr: £125. (Epsom) 0372 729475

● KENWOOD TM221E with mic and m/bracket. VGC: £200ono. G0KIE QTHR (Greenford) 01-575 2671

● FT290R 2m all-mode. Sommerkamp, 2 sets of nicads, chrgr, c/case, car mounting tray: £245. (Newbury) 0635 200974

● FT102, mint cond. AM/FM, CW nar, boxed, manuals etc: £525. G0JTQ. (Swanage) 0929 424908

● MARCONI marine Atalanta. Superb all valve RX, 14kHz-28MHz. Int mains PSU and spkr c/w h/book. Exc.cond. Prefer buyer collects. Bargain: £130. G4YXX QTHR. (Wincanton) 0963 32389

● FOR Commodore 64/PK232. ICS s/ware cardridges, Comlax, Pakrall, Interface. Mother board: £50. Easylic, Easyscript, Toolkit 4, Tasword. All docs: £20 or £60 the lot. Post paid. New computar forces sale. GM4DYZ QTHR. (Perth) D738 82699

● RACAL RA1217 solid state rcvr: £265. TA940A 100W linear amp: £100. Pye VHF tcvrs, caps, transformers, racks, valves. Large collection mini LP records. Ask lists. Exch for Bird Thrulina equip, Versatower, VHF/UHF equip/beams WHY? 0467 25365 after 8.00pm

● TRIO TS520 mic, manual. GWO: £300. Marconi Elettra, Mercury pair rcvrs. Ideal SWL, TV5 TX/RX. 2 Pye Dolphins. Ideal 160-80m TX/RX AM/CW. Offers for quick sale. FDK700EX FM mobile: £130. Pair 813, £40. Pair 6146B: £15. G4EUW. (Brightlingsea) 020630 3072.

● YAESU FT290 Mk2, FL2025 25W amp, m/mount, m/mic: £340. G0ANV QTHR. (Cambridge) 0223 467362 after 6pm

● ICOM IC2SE: £230. Akai 4000D stereo deck: £80. Spectrum +128 with Plus-D interface: £90. Peter G0BAG (Portsmouth) 0705 596087

● NRD 515 HF rcvr 0.01-30MHz with AM/SSB/CW filters. Manual, mmac.cond. Only: £625ovno. Mike G4FBK. (Northwood) 09274 22766 w/e or eve after 7pm

● TRIO 520SE HF tcvr. Exn.cond: £295. FTV107 grey, fitted 2m with interlane for use with 707, 747: £110. Micro 2E: £130. Drake R4B: £175. IC2E with base nhrgr, spare batt: £135. Hallicrafters SX110: £65. SEM ORM Eliminator: £40. (E.London) 01-534 3460

● RI 155. VGC, untaunhed: £60ono. R216. VGC plus PSU, manual, untouched: £90ono. Ex-MOD portable/underwater Magnetometer: £75. Terry. (Hallnld) 0707 279609 day

● YAESU FT101ZD with FM board plus matching FV101DM digital VFO: £530. Realistic PRO2021 scanning rcvr: £115. All in exc.cond c/w org packing and manuals. G4LTM OTHR. (Dukinfield) 061-338 3787

● DRAKE R4B RX in GWO. Fully xtalled. £150ono. G4VAM. (Peterborough) 0733 62848

● ICOM 720A HF tcvr 100W all-mode incl FM module 13.8V solid state PA. £550ovno G4RNI not OTHR. (Gateshead) 091-469 0724

● ICOM IC402 mint, boxed with manual and extra xtals: £200. Plessey/GSZVC 9MHz SSB tcvr module, ideal for G3TSO invr: £35. RS 19in rank cabinet, 5ft high an castom c/w 2 eurocard sub racks: £40ono. 14ele mal 70cm beam: £20. G4IYA OTHR. (Kent) D795 421207

● HF ATU Kenwood AT230 160-10m. Exn.cond, used lwine only. Orig.packing. Bargain at: £150 plus p+p. 061-941 2822

● YAESU MF1A3B boom mic, SB10 PTT: £25 the pair. Datong D70 morse tutor: £30. No.2 morse key: £5. G7AJW OTHR. (Sewbridgeworth) D279 723336

● AOR 2001 scanner 25-550MHz. VGC, boxed: £250. G6XSI QTHR. (Bury St Edmunds) D284 702292 after 6pm

● 204BA 20m beam: £165. 402BA 40m beam: £175. Both wind up tilt down tower: £500. Racal RA17: £175. Racal TX MA79: £175. K2RIW 70cm amp 500W aut and PSU 1A. 4CX250 bases: £10ea. G4HXU QTHR. (Thame) 084421 3361

● YAESU FT101ZD FM Mk3: £465. Yaesu FTV901R tvtr 2.6m. £285. Tono MR15W 2m all-mode linear amp: £115. All VGC. (Workington) 0900 603647

● ICOM IC740, FM board fitted, mint cond. Orig.panking: £425. Datwe RM940 infra-red mahile mic, box, never used: £10 G4PZK. (Reading) 0734 68712

● MAPLIN Matinee electranic organ, 2 keyboards, pedals rytims drawbar vorting rotor sound circuit, data. Oilers around. £175. G3XKA. (Woking) 77362D

● AESU FT77 tcvr, fitted narrow CW filter, marker, AM board fitted, FM board also available, with m/brankot and matching FC700 ATU. £475. Also Drake R4C rcvr oxn nond with MS4 spkr: £350 ar swap both for Corsair II or Drake TR7A. G4OLC. (Choppington) 0670 655953

● PAKRATT PK64 full updates, as naw cond. Cables, manual etc. £150. G3CXI QTHR (Bishops Clavo, Cimlionhanr) 0242 673834

● ICOM IC735 gon.nov, narrow CW 500Hz filter. Electronic keyer boards, desk min, boxnd: £800 AR2002 snannor, boxed: £325. Both mint cond. Los COKRA. (Ramsgate) 0843 592864 day 0643 581364 eve

● 15M mrono band yagi: £55. Buyer collects. G4XWQ (Barnstable) 0271 77001

● SOTA 2m 100W linear amp, built-in AC PSU 10W in, 100W out: £60ono Wkg order. G4BAL OTHR (Sidcup) 01-302 4062

● TRIO TR2300G 2m tcvr: £125 Matching VB2200 10W amp: £60. Trio TR3200 70cm tcvr: £95. 2ft Cassegrain feed dish and tripod. £70. Portable PSU for 1kW linear. £100. GP232m colinear: £20. Commodore 64, 1541 disk drive, 1701 colour monitor plus 80 disks: £250. Magnalm mobile aerial base: £20. CDR Hamm-m heavy rotator: £85. Channel Master light rotator: £25. MM 23cm cvtr: £25. Bird Tiny-line 1kW plug-ins 100-250MHz, 200-500MHz: £25ea. Jayboem 10ele 2m long yagi: £20. G4BBR OTHR. (Chellenham) 0242 527588

● YAESU FT902DM HF tcvr, SP901 axt spkr. Exn cond: £575. FT290R Mk3 c/w case, nicads, nlrgr, m/mount: £240. Buyer inspects/collects or pays carr.extra. G0DLF. (Northants) 0604 831061

● HF PA transistors 2PT9795: £15. Broadband PA unit G3TSO design: £15. 15V 14A PSU 120V AC in P easy mod to 13.8V: £12. Rotator alignmnnt bearing: £8. 4m4ele: £0. 2m8ele: £8. 70cm8+8: £8 2m PA unit (4X250B) and 1000V PSU: £20. Large coax relay: £5. 4 Pya type aerial changeover relays: £5. 4m tvtr 60W O/P SSB only 28MHz IF: £20. 100 to 695MHz 8-pole SSB xtal filter: £10. Heathkit GDO: £15. 4X250 and holder: £8. 3 3 hook guy clamps: £5. Buyar nollects larger items, lleo rest can extra. G4BWW OTHR. (Southport) 0704 29068

● YAESU FT790R FM/SSB/CW 70cm TX/RX with nicads and chrgr. Exc.cond: £250. FL7010 r0W linaar amp incl for good measure. 13ele 70cm yngi with UR67 cable and fully auto ant rotator. Good cond: £35. G3WYV. (Rochdale) 0706 42821

● BBC-B+ fitted Watford 1.44DFS (ROM). All manuals, twin joysticks, s/waro (disk). Mini Office II, Gemini Database Replica III. Also a few games and some s/ware on tape: £280. Vic G4YWY. Dllce hours 0425 478640 or 472008

● ABSORBTION wavemeter Marconi TF975 90-110kHz in 8 ranges, mahogany box: £55. Inline wattmeter US Navy TS3499 2-1000MHz 10-1000W in 5 ranges: £80. Both with inst book. G3VXZ OTHR. (Mardenhead) 0628 27350

● TH25E 2m h/h c/w SMC3r spkr/mic and DC1, PG2V 12V lead, case. All boxed, manual etc. Oolivor in NW: £180. (Liverpool) 051-250 9814

● B2 wartime TX/RX. Racal TRAI 338 SSB tcvr. Clandestine WW2 rcvr DST100. TCSI 2 TX/RX, WS48. WS38 AFV. WS19 on carrier. AI 3-PA unit. HRO. C42, 52sel RX. RI 155. Eddystone ED35 rcvr, Fluke 73. IC240 2m mobile. Thandar freq.nounter TF040/prosealer. Gould dual-beam scope. G4OFO OTHR. (Kingston-upon-Thames) 01-949 2317

● G2DYM trap dipole ID2ft long, 5-bands with twin loader: £35. Yaesu FTV707 tvlr fitted 144m/c, boxed, VGC: £75. Morse key type-O: £5. WH.Smith data renorder: £12.50. Tnstar 3 HF vert c/w radials. VGC: £65. G3OAZ OTHR. (Basingstoke) 0256 465126

● NATIONAL HRO Senior, octal valves, 9 GC coils, mains PSU/spkr, exc.cond: £70. BC346L mains PSU/spkr, exn.nond: £45. BC348O working, one band u/s: £20. Avo magic-eye LCR bridge: £5. Will swap various of the above for solid state GC rnvr. Manuals for various surplus rcvrs. Lots of components, valvas atc. (Herts) 0727 38908

● TOKYO hi-power Mlnro 7 3ch 70cm h/held in good cond. Boxed: £60. G4KUR OTHR. (Solihull, W.Mids) 021-743 6701

● YAESU/Sommerkamp 101ZO MK3 HF tcvr fitted fan, FM unit and c/w AM unit: £430. Trailer mounted galvanised lattino tower with haad unit, rotator, winches, 3ele tribander, 40ft: £500ono. Gavin, GW0HLR DTHR. (Bunkley) 0244 543219

● FTV901R Yaesu tvtr fitted with 2m and 6m boards. Suitable for FT901DM and FT101ZO series. Exc.cond: £255. Genard G0EHK. (Nr Preston) 0772 614200

● YAESU FL2100B linear, aervined at nost nearly £300. Now 572Bs fitted mains filter. All loads, manual 100% working order. Bargain at: £425ono. Vnw Dewsbury Electronics or G3BWN OTHR (Nottingham) 0602 226789

● TS830M Imman.cond: £650. TS611E, as new, boxed. £700 FT690 Mkl with 25W linear: £250. Mike G4ZCO. (Bristol) 0272 513573

● COLLECTORS - 250 well assorted valves 1930s-1960s, untested but approx 1/2 boxed: £25 1957 Geloso VFO built into multiband TX. With 2x807 output: £25. 1956 modulator, xtal mic to p/pull KT66s with Woden UM3 MOD transformer: £35. 1956 Acas MIC36 xtal mic: £10. Eddystone 698 slidorule dial. £15. Books, Newnes Complete Wireless, 4vols nomplete, probably 1930s. Caxton, Engineering Workshop Practice, 3vols nomplete, probably 1930s: Oilers. All plus narr. Inn, GM3LGU OTHR. (Ounoon) 0369 87341 nltor 6pm

● TRANSFORMER PRI 240V sens 500-0-500 250mA 3x 6.3V/3A: £10. Valvoo 4x807 in case: £5. Buyer collects. Valves PL509 for linears: £3. Many TV types: £2. All plus p+p. Various caps, panal meters, panels form PSUs etc. G3UVB QTHR. (Oxford) 08675 2486

● MM 70cm 100W amp: £270. SSB Elontronics LT23S tvlr 10W, high stability option: £300. Crotton 9m B/W monitor: £25. John. (Calchestar) 0206 860238 ave

● ICOM IC451E 70cm multimode tcvr, VGC, boxed with SM5 mic and Mulek TLNA432S preamp: £425 Icom IC25I E 2m multimode tcvr with Mulok F/E, VGC, boxed: £425. BNOS 144MHz linear, 10W in, 50W out: £65. 50MHz Spectrum TX ond RX tvtr boards, assembled and tested: £35pr. G6DBX OTHR. (Burgess Hill) 0444 246767 ovu 6-9pm or daytime w/e

● COMPLETE 6m station, FT690 lmaar, 3ola mol ant: £325ono. 2nd licence to support! G6TTL QTHR (Home Bay) 0227 361740

● AMP Supply Co HF linear LK450, new. £750. Japan Radio Co TX/RX JST125 superb: £750. G4SGV DTHR. (Redditch) 0527 545304

● FT726R baseslation fitted with 2m only. Pristine cond, boxed with manual: £500. Code Mastor CWR610E CW/RTTY decoder and morse tutor, manual and boxed: £95. Harvey, G4YNI OTHR. (Mannlroster) 061-740 7708

● FT790 70cm all-mode tcvr, brand new nicads, orig.packing etc: £250. TR2500 2m FM tcvr and axtras: £180. C64 computar new 1541 disk drive, tape unit, books, leads and some s/ware. £180. Bob, G6EIH QTHR 0283 42862

● BNOS 12/20E PSU: £120 CTE1600 2nt with BS2S linear: £180. Both imman. John, G4YDM OTHR. 091-416 2608

● TS520SE HF tcvr. New sol of valves in PA. Also on drive stago: £375ovno as that,s what I paid boloro lnting new valves. Also FP707 PSU: £100ovno. G0LUO DTHR. (Oxford) 0865 68042 after 6pm

● ICOM R71E RX .1-30MHz, FM board fitted Boxed, as new: £500. AR2002 plus discone: £325. G3VEZ OTHR. (Bournemouth) 0202 530436 after 6pm

● CUSHCRAFT A3 and KR400 rotator: £150 or axch for inband vert and/or decent swr mnnitor. Nol OTHR. (Lowestoft) 0502 730523

● TRIO 2m multimode TR751E: £350. Yaesu 6nr multimode FT690Rll: £299. MM linear amp 144MHz 50W: £75. Yaesu linear 10W for use with FT690 FL8020: £75. Diamond anl SX200 swr/pwr meter 1.8-200MHz: £40. Kenwood SP50 axt spkr: £30. Yaesu SP55 axt spkr: £30. All tha above boxed with manuals. Altran 4 socllan 55ft lower c/w head unit (WM) and winches: £550 Tower only 6mths old. Buyor to collect. Amega Commodore computer c/w Commodore monitor. All manuals, disks 2mths old: £650 (Brookwood) 04867 81202

● COLLINS S lina. £550. Icom IC202S: £110. Yaesu FT703R h/held: £90. Yaesu FL2100Z WARC, hardly used, boxed: £550. G4LW OTHR (Trowbridge) 0225 753166

● TEN-TEC Century 22 HF CW tcvr, 50W with Daiwa 5A PSU. Little used as new: £295ono. Also Hallcrnllers HT37 SSB/CW HF TX. Good cond and working order: £80ono. G4AIH OTHR. (Sale, Cheshire) 061-962 1904

● DONTT miss this opportunity to obtain an unused VHF/UHF Yaesu commo RX, FRG9600M plus AC adaptor: £375. (Coventry) 0203 664244 Mon-Thurs only

● YAESU FT211RH 5/45W 2m tcvr with Yaesu mobile headset and switchbox. M/mount, manual, orig.packing: £260. Inom IC2E, s/case, chrgr, spkr mic mabile PSU. manuel, orig.packing: £110. G6GLP QTHR. (Ashby-de-la-Zouch) 0530 414164

● FTID2 HF TX, FCI02, SP102, FM board fitted, narrow filters SSB/CW. Exc.cond: £725ono. G4GWF QTHR. (Leigh) 0942 260088 after 5.30pm

● HQ1 mimbeam: £70. Rotalar AR40: £50. Tero sig.gen: £20. GM4BOA OTHR. (E.Kilbride) 03552 24087

● VHF/UHF colinear free with QTH Willingdon, Eastbourne. 3-bod detanhed, exc.position. Exc arder. Reduced to £154.950. Details G4OHB. 021-449 3530

● KENWOOD TS950SD with MC60A mic. Latest top of the rango model. New Jan 1990. Operator just too mic shy to use it. Cost £3287 will accept: £2795. Na ollers. G0OBR QTHR. (nr.Loughborough) 0530 222453

● YAESU FRG7700 RX: £250. Heavy brass GPO morse key: £20. Steve Lillay. (Slovenage) 0438 74220D x526 day

● CIRKIT airband rcvr, built and working to spec on 12V: £70. Realistic DX440, exn. S/W RX, as new: £70. Past on both oxtrn. Avo AM/CW sig gen 2-250MHz, decent output attenuator: £50. Buyer must collect. GM4UJZ OTHR. (Edinburgh) 031-331 2755

● NORTHERN Ireland. 50ft talescopin tiltover tower: £295. Hygain Explorer tribander: £250. Hygain TH5 tribander, new, boxed: £390. Mulak 2m masthead preamp, new: £70. Bird Thruline with 7ala and loathar case: £295. YK66 CW filter: £35. Shure 444D. £45. NC7 base chrgr: £20. NC8 base nlrgr and mains adaptor: £39. 10XY: £20, 12XY 70cm: £20. Ringo Ranger: £15. GI3KDR. 0846 689622 eve

● TRIO TS530S with CW filter fitted, Imman cond: £525. Trio TS120S, VGC: £300. Kenwood TR9000 2m all-mode invr, good cond: £250. Racal RA17HF rcvr, VGC: £150 Buyer to collect. G4NOV. (Melbourne) 0332 864007

● FT767GX tcvr latest type, All modes 70cm/6m/2m HF unmarked: £1700. FT960 tcvr exc.cond, unmarked: £900. SM220 monitor: £220. Oscar swr: £30. 70cm 19ele ant: £20. 6m new 3ola: £25. 2m 8ole: £15. M/M linear 10/100: £110. Coax cable: 35p.m boxed and manuals. Howard, G0HZH OTHR. 0394 460474

● YAESU FT726R multimode basestation, 2m/6m/70cm sat modules, hardly used. As new: £975. GI YFU. (Leigh-on-Sea) 0702 711181

● TRIO TR2300 2m/FM portable TX/RX. 40 switched PLL synlh channels on eanh 144/145, rnpeator ollset with toneburst, c/w nicads and h/book: £100. Belcom AMR-104H marine band scanning rcvr 240VAC/12VDC 9ch (8 xtals fitted): £30. Brian G8HIW. (Altrincham) 061-980 4486

● TEN-TEC Century 21: £100. Rear of cabinet slight transit damage. Tono 7000E: £200. AEA-CK2 contest keyer. With bennhor paddle: £85. Without: £60. Manuals for all. Will haggle (upwards preferably!) (Nr.Huntingdon) 0487 841558

● IC735 only 12 wks old. A genuine reason for sale: £750ono. TSI 20V tcvr, good cond with mic: £250. BBC-B computer issue 7 board with twin 80/40 disks. High res colour mnnitor, extra Z80 processor ROMS CPM Wordstar Perfect s/ware: £400ono. (Shottisham) 0394 411957

● PSION Organiser model XP: £50. Z88 computer with 32k Eprom +32k RAM pank: £150. Ida al lor packet. 10ch xtal controlled rcvr 2nlr incl: £30. All plus p+p. Iain GM1PSU. (Livingston) 0506 683091

● KAM Kantronics all-mode TNC. Boxed, leads, documentation: £185 Microlina multispeed modem V21 V22 V23 suitable Prestel, Telecom Gold etc: £80. KM4000 keyor, mamory as featured Feb 62 RadCom. Store COnalls etc: £15. Beocher key, nhrome finish (zambic): £50. Will sell or exch with cash adjustment for Avo 8 multimeter. Must be VGC. G4RKO OTHR. (Newbury) 0632 60263

● FT290R MkII, ninad pank and chrgr. MMB31 m/mount, FL2025 25W linear: £475. TS760 2/70 multimode: £600. KPC4 dual port TNC: £190. All in orig boxes. Could pt/exnh for K2RIW PSU or WHY? Stewart, GM4AFF nol OTHR. (Aberdeen) 0569 31182

● TV station transmitter-namern-up cvtr 435nc/s ORP sale/exch. G3NXD OTHR. 0562 850570

● MMT 28/144MHz linear tvtr: £85. AEA DDX-64 contest simulator: £50. AEA PK88 (now lnmware): £105. Sony ICF2001, brakan, lar spares: £5. Gam quad alloy spider: £5. G3VQQ. (Ossell) 0924 263902

● TONNA 9/2m yagis boxed, unused: £22ea, £40pr. N-type connenors for LOF2-50 3-8in loam coax. New, unused: £2ea. 4 for: £5. Magmount VHF whips: £4. All car axtra or collect. Oilers considlored for ants. G3HRH OTHR. (Winchestor) 0962 712045

● HF ant 4-band vert. No rad/als needed: £50 80col dot matrix thermal printer. RS232 compatiblo, wired for usa with Spectrum and Interface One: £50. Pace Nightingafe multispeed modom. No connecting cables but fulth/book: £50. Amstrad 27/81 FM CB converted to 10m FM: £40. Cossor 1035 ex WD scope, alt but working: £10. Buyer collects. G4UZG. (Manchester) 061-790 3461

● TRIO TR7800 2m FM 25W tcvr c/w m/mount: £130. Icom IC02E 2m h/held c/w spkr mic and s/case: £110. KENPRO KP202 6ch 2m h/held S20, S22 and Raynet freq, nicads incl: £60. BBC-B issue 7 Micravtec colour monitor, Viglen dual disk drive 40/80 track Acorn Tolotext adaptar and soma s/were: £250 complete. Job overseas causes sale. G4FBI OTHR. (Penrith) 0768 890688

● CAPCO ATU SPC300 c/w h/book: £130. SEM ORM eliminator: £50. Alan, G0KMC OTHR. (Aylesbury) 0296 29342 ave-w/e

● TRIO TS830S, exc.cond: £700ono. Yaesu FT480R multimode: £250ono. G4OKS. (St.Austell) 0726 813935

● ARIES 8-32 RAM expansion for BBC-B, h/book. Surplus ta requirements now WP transferred to PC: £25. G4LWA OTHR. (High Wycombe) 04943 1755

● LINEARS 2m MML144/100LS 100W: £105. MML144/30LS 30W: £45. KENPRO 2m h/held KT200EE, similar to Icom IC2E, plus chrgr, apkr/mic, case and orig packing: £110 or the lot: £240. Exn.nond, buyer collects or pays carr. G4UVB QTHR. (Formby, Liverpool) D7048 79886

● COSSOR 467AC short, med, long AC superhet, all ong except valion/ott. Working arder. No mods or restoration, best offer over: £20 from collector secures. 3-gang x 500pF with reduction drive, 1x approx 500pF single, air variables (ideal ATU). 4-gang approx 350x2, 250x2 B40D cap: £10, £5, £10. Buyer collect or pay carr. B40D unit (ceramic shall). G4LEG QTHR. (Crewley) 0293 32825

● ORAKE rcvr model 2B with Q balance 10-80m, sal of spare valves: £150. 10m prol converted Cobra 148GTL with push button scan and LED freq.display: £125. Also converted Lucas CB to 10m nhannel 1-40 display: £40. Capco SPC100 ATU 2m: £30. (Berkhamsted) 0442 873826 after 6pm

● TS520 Invr with CW filter, spara valves and mic, 2m tvlr model TV502, remote VFO520, diellon monitor SM220, Kenwood SP520. All VGC and with operating manual: £575. Advance digital multimater DMM2: £25. LSG17 sig.gen 300kHz 450MHz: £75. Buyer inspects and collects. GI YFK. (Stevenage) 0438 359427 after 6pm

● YAESU FT221R 2m multimode, Mulek F/E 15W 144/146 covorage, Mint cond: £300. Also Datong D70 morse tutar, as new: £35. Hi-mound morse key, marble base, as new: £30. G4TSZ. (Manchestor) 061-794 6536

● SILENT key sale. Junkars and RAF keys. Both immac: £35ea. RS 500VA Isolating transformar 200/240 in tapped out: £30. Plus carr. Avo 8 Mk2 in nasu: £40. RF thermo millammeter 2.5in 0-6MA: £15. Douglas 300VA trans 200/240V primary 0-30V in 13 taps AT 10A out: £10. Plus narr. G2AK OTHR. (Aldridge) 0922 52518

● ICOM 735HF all-mode, boxed, hardly used only a few months old: £695 Incl dallvary UK. 676MO OTHR. (Shoroham-by-Sea) 0273 453810

● TRIO/Kenwood service manuels R2000: £6. TS940S: £12. Inni post. G3JHP QTHR. (Horley) 0293 774303

● YAESU FT757GX with FG757AT. GWO: £700. Would consldor pt/exch Sommerkamp 788DX or similar. 0742 692827

● PACKET TNC Tiny-2 with PMS, as new cond with h/book: £95. Plus post. G3KZU OTHR. Oxford) 0865 63000

● YAESU FT209R 2m h/held, Yaesu FT709R 70cm h/held, 2x NC15 PSU/nhrgr units, one wall chrgr, spare FNB3 nicad, 2x MH12A2B spkr/mics, YH2 headsal. As new: £395. Shura 144/70 desk mic: £18, 2m 7/8 mobile ant and coax: £10. GW4WBT. (Llandudno) 0492 76107

● ICOM 32E with extended RX, Oscar mobile ant, spkr mic. As new, not used on TX: £325. G4ZOA OTHR. (Portland) 0305 820025

● TS930S with CW filter, Immac: £985ono. TS680S as new with mic: £725. G3GIQ OTHR. (London) 01-567 6389

● FL2100 linear amp, one (new) spare 572B, VGC: £300. Akrco DJ100E 2m h/held, apkr/mic, 7.2V and 12V bail panks, ED6 and EOI2 nicad nhrgrs, cost £335, accept: £220. Sommerkamp TS280FM mobile tcvr: £80. (Barrow-in-Furness) 0229 474147

● SONY Airband 7 radio FM scan 76-174MHz, AM scan 150-219kHz. Little used: £150. G7CDK OTHR. (Royston) 0763 262443

● RAOCOMS 1967, 1969-77, 1980-88 Some bound vols. Best ollar secures. Buyar collects or possibla delivary. Also pair Kass stereo phonas PRO/4AA, boxed: £20. G3YWU OTHR. (Oolamere) 0606 888277

● ICOM IC490E 70cm multimoda, complato, boxad, little used. Mint: £300. Jolm. (Slovonago) 0438 721373

● FT708R 70cm h/held with nicad, chrgr, spkr mic, PA3 car adaptor and h/book: £149. G3OGP OTHR. (nr.Horsham) 0403 722275

● EXCELLENT VHF QTH, West Hill, Winnanton, Somerset, c/w large 432, 144 and 70MHz beams on a 35ft mast heavy duty rotator low loss cables and planning permission. Also larga 4ele 10m boam an nrasl. Enough space for an 80m dipole in a straight line. 3 dble beds 3 reception etc. Quiet location on edge al town, views across open countryside easy access to London via train or A303/M3 Both and Bristol 1 hr: £99,750. G3ZXX. (Wincanton) 0963 34360

● SCOPE Cossor COU150 solid state 35MHz: £140 or Hitachi V212 20MHz: £220. BBC-B computer, Watford DDFS single drive, Wordwise, Radio plus games s/waro: £250. Spy transmitter SST-1-D, single 616: Oilers. SG.Brown High 2 phonas: £20. G3TSO. (Carencsiar) 028 575 532

● JST135 tcvr bandwidth option + NBD520 PSU/spkr, mint cond, new 12/1/90. 6wks QRP use. Lawe supplied warranty, mic, manuals, boxes: £1400. Save £400 on new Yeesu FT7B tcvr, 160m, FM, FP12 PSU/spkr, mint cond, mic, manuals, boxes: £355. GW4RLP OTHR. (Caernarfon) 0286 5264

● FT102 HF xcvr, FC102 ant tuner, FC707 ant tuner. All mint. Owner oldlimer now silent key. Oilers to G3KPO OTHR. (IOW)

● YAESU FT707 tcvr, GWO: £300. Datong auta speech processor, axc cond: £45. Sony rcvr

ICF2001D, as new. Bargain: £200. Halsley dipoles never used outside 15m: £12, 10m: £10. Stainless steel 2m S/8whip on Magmount. Perfect: £15 G3UFO QTHR. (Solihull) 0564 777802

● COMPLETE KW station. KW2000E PSU/spkr 1100 multiplier, 1000 linear, 107 ATU, 108 monscope. 6 matching units. Manuals, spare valves: £700. GW3PRA QTHR. (Flint, N.Wales) 03526 3030

● GAREX SX400 remote control interface c/w BBC s/ware: £80. Linear amp 25W in 100W/12V DC: £60. Racal counter 9915 10Hz-520MHz 8-digits: £100. Marconi TF955 AM/FM 220MHz sig gen: £60. Datong AD370 active aerial: £30. Datong D70 morse tutor: £20. Bird 43 cased, 7 inserts HF, 2m, 70cm: £140. Various inserts: £20ea. HP3406 broadband VVM 100kHz 1.2GHz: £40. Tolonic 3300 sweep system, CRT, cables probes. Observa VSWR/filter response 100kHz 1GHz c/w manuals: £150. G8PYC QTHR. (Thame, Oxon) 08442I 5857

● KENWOOD TS430S with PS430, AT250, MC60A. All unused, boxed, will accept £950. G6SVG QTHR. (Rechill) 0737 761399 afternoon/eve

● YAESU FT225RD 2m basestation: £500. Yaesu FT480 2m base/mobile m/mode. Both magnificent specimens. Yaesu FT209 2m h/held with all the bits and pieces: £150, Emie G4HTE. (Potters Bar,Herts) 0707 54905

● TWO Pye PF2s FM low-band c/w aerials, mics, batts, chrgrs, plus 2 non-working sets for spares and service manual: £60one. Prefer buyer collects, or plus carr. G1HHU QTHR. 061-773 6732

● KENWOOD TS530S HF tcvr, immac cond with spare unused matching pair of 6146B PA valves: £575. G4JTR QTHR. (Reading) 0734 476873

WANTED

● EDDYSTONE EC958 RX, 10kHz-30MHz, or similar with LW coverage. Display unit with Eddystone considered, otherwise digital readout preferred. Must be in VGC. Also, LW down-cvtr for Racal RA17L reqd. Will collect. David. (Shanklin,IOW) 0983 864227

● INTERFACE unit for Amiga 500 plus s/ware. Any info to Paul Pain RS92338, 3 TK TRPT Sqn, BCT BFPO 18. 01049 5251 31615

● ORIG NRO spkr, Morriss. G4GEN QTHR. (Nutley) 08257 2205

● H/BOOK or info for Schlumbergar Stabilock 4011 radio test set, Pye PF65 nicad batt, leather case, chrgr WHY? Late 1950s Era valve car radio 12V positive earth. P.W.Brown, 33A March Rd, Wimmigton, March, Cambs, PE15 0RW.

● TRIO TL120 linear amp. Cash waiting for this or other ecos for TS130V tcvr WHY? Alan G4PSU. (Newbury) 0635 71150 eve

● KW2000B tcvr with mic, PSU and spkr in GWO please. (Stockport) 0625 874049

● DATONG filter type FL3. Also operating data for scope type D31R by Telequipment. G4RHI QTHR. (Axminster) 0297 32572

● S/WARE for Apple II plus - particularly AMTOR, RTTY, morse. Also logbook record etc WHY? Barnard, G3ESW QTHR (Stalford) 0785 662350.

● 2M multimode. G8XNC QTHR. (Bromley) 01-462 4461

● BUY, photocopy or borrow A Guide to Amateur Radio, 1st ed. Urgently read for study, gruat care taken, all cost readily paid. Bernard Litherland, G4IMT QTHR. (Chippenham) 0225 891254

● DOCTOR DX and Doctor QSO computer CW simulator for Commodore 64/128. David Cole. 0-594 3495 home 04023 74043

● PILOT U650 wanted by keen collector. Any cond. Good price paid. Other 1930s broadcast RXs of interest, particularly Pilot models. AR88D and other RXs available for p/exch Either way will buy RX valves in small numbers G0HPM. (nr.Reading) 0734 713332

● 19SET Mk2. Also Tannoy Tank mic. Loudspeaking apparatus No 9 and 38sat. Taylor, 89 Lion Rd, Twickenham, Middx. 01-891 2820

● TANDBERG TCD330 cassette recorder. Must be in good cond. Basil, G4TIC QTHR. (Leeds) 0532 402909

● HELP required by white stick operator. Someone to install an audio device to read off the swr meter of an ant tuning unit. G3YQE. (Brentwood, Essex) 0277 823434

● ALINCO ALM203 2m h/held or similar. Era Microreader VHF scanner. HF SSB TX/RX faulty to linker with. 0843 294446

● OST mags 1988 to present. G3UGL QTHR. (Bedford) 0234 750050

● YAESU FT75 KW Vespa Atlas 180, 215X or similar older equip WHY? Len G3XXO. (Newcastle-upon-Tyne) 091-478 2965 10am-5pm only

● GEM quad or hygain quad WHY? G4HXU QTHR. (Thame) 084421 3381

● HF AM TX DX-100 or similar. Will collect. Wanted Goniometer. G3WRT. 0473 311665 after 6.30pm

● RECRUITING 24 would-be club members, all British Amateurs, to share in the enjoyment as well as the running costs of a radio amateur exotic tropical island beach villa. QTH c/w HF station, to be shared at the rate of two weeks per member annually. 0908 668189

● CIRCUIT dia. or manual for Fisk Radiolette (Australian) Murphy AI 22 Masteradio D184, Marconi T56A, Murphy U102, Bush PB53. G0EDG QTHR. (Bristol) 0454 614178

● ICOM IC215 2m FM portable. Also Icom IC402 70cm SSB portable. Both must be mint with orig packing if poss. (Warwick) 0926 498388

● DRAKE DSR2, R4245, any Watkins Johnson. Also Tracor VLF phase rcvr. G3FK. (Shrewsbury) 0743 884858

● MAINS isolating transformer 240VAC in/out. Minimum 500VA. Megger (crank type) insulation tester or similar. Roberts, 26 Beech Ave, Brentwood, CM13 2DX.

● NEWLY licensed RAIBC member requires solid state rig, plus PSU and ATU. Kenwood TS140S/680S, TS430S/440S, or Yaesu FT747, 757GX Mk2, or Icom IC725/735, IC740 preferred. Will travel reasonable distance from S Hants to view. Contact in 1st instance G3AUV QTHR. (Shirrell Heath) 0329 833069

● CIRCUIT dia. linear amp CP163X II. Also source of supply HQ lead acid batts with cells extstrapped. G0EG8 QTHR. (Firsdown, Salisbury) 0980 862681

● TEKTRONIX scope 545A, faulty, incomplete etc (for spares). Also, if such a thing exists, Heathkit SW7800 rcvr, unfinished, faulty etc. Also reqd, certain valves. Have some to dispose of, would be interested in buying, selling, swapping. Chris. (Reigate) 0737 222712

● 2M multimode tcvr TR751, FT290R2, IC275 preferred. Also FM h/held IC02E, TH215E or similar. Plus VSWR meter and PSU. (Wilmslow) 0625 531154

● WIRING diagrams, manuals for Dymer Lynx 830 and Pye F9U. E18FC QTHR.

● SERIOUSLY seeking SSB: 2m rig needed: Yaesu FT290, Icom 202, Mizuho WHY. G4CYB, 5 Blundres Ln, Enville, S.Staffs, DY7 5HU. 0384 873593

● RAF air publications relating to H2S/ASV radars, navigation equip ie Babs, Oboe, Loran, Gee etc Also ex-RAF radio stores index publications AP1086-Sec 10. Exc. prices offered. Would purchase post-war magnetrons, klystrons, T/R cells, TWTs, thyratrons, special types of M-OWEEV tubes and CV types Many thanks. M.Gee, 17 Foxley Cl, Mountford Est, Ferncliff Rd, Hackney, London, E8 2JN 01-790 2846 or 01-254 9083 anytime.

● H/BOOK, copy circuit requested to purchase covenng Pye Sealarer 1112 rcvr. Star rcvr SR550. G7CMD. (Tyneside) 091-268 4085

● HF or 2m mobile any cond. Can repair. G3NXD QTHR. 0562 850570

● FERRITE rod aerial in VGC for Realistic OX300 restoration. Junked or scrapped OR666 for rebuild needs all casework and panel mechanical. G4LEG QTHR. (Crawley) 0293 32825

● PYE P5012 service manual to purchase or loan for photocopy and return expenses paid. G3KZU QTHR. (Oxford) 0865 63000

● MORSUM magnificent O-code kit as published by MM about 3yrs ago. Will pay for post, copying etc with a bonus thrown in. D Alexander G0KCO. (London) 081-995 2517

● KIND and gentle morse key, to help enthusiastic beginner to pass the morse test. G0HWF. (Hereford) 0432 56466

● MORSE reader, ICS Electronics MBA-RO. G3TJY QTHR. (Poole) 0202 622142

● FT101B F/M module made by G3LLL with mists Also circuit for Europa B 2m tvtr. 0685 881694

● 1KW KW dummy load must be in GWO. £50 waiting. (Solihull) 06755 2624

● MIZUHO 2m TX/RX SSB portable. Any cond G8CKM QTHR. (Wem, Shropes) 0939 34605

● 12V valve car radio working or not. Low-band Pye M294, G4AJE QTHR (Cambs) 0354 741 168

● SHIMUZU SS105 or FT7. QRP tcvr. John, G0GUL QTHR (Coventry)

● RSGB car badge I understand these have been made in the past. I would like one for my car. Can anyone help me please? Nat QTHR (Kidderminster) 0562 60867 anytime

● KENWOOD TL922 HF linear amp in good cond G3MLX. (Hull) 0482 52641

● SKIPPERED boat hire for MM expedition. About 1wk between July 21 to August 5. About 5 keen Telford landlubbers. Possibly sail Western Isles area from any port. Your price within reason! G3UKV QTHR. (Telford) 0952 255416

EXCHANGE

● KENWOOD TS670 all-mode tcvr 10W output 50, 28, 21, 7MHz GC rcvr twin VFOs. VGC. Want JRC rcvr or WHY? G3GHB. (Worcester) 0386 792582

● ICOM IC245 2m multimode, 1W/15W out, 144-148, mic, m/mount, manual, VGC, boxed, for Belcom LSI 02L or Ham Int Jumbo Mk3 or WHY. Also Yaesu FT200 HF matching PSU, manual, needs alignment, works OK. Exch for FC902 ATU. Sorry no phone. Ian RS84695, The Dormouse, 5 Sunsal Walk, Bush Est, Eccles-on-Sea, Norfolk, NR12 0SX. All letters answered

● HAVE several Wireless Wonds 1946-52, parts from Eddystone 770U rcvr (nearly everything present but short on valves), tatty Philco batt valve rcvr, and 300+ valves. Would appreciate Tektronix 545A scope and plug-ins (faulty, incomplete whatever). Also require certain valves. Will gladly swap/sell/buy. Chris (Reigate,Surrey) 0737 222712

● EXCH Standard 5200 dual-band 50W mobile tcvr with duplexer, hardly used, in perfect cond. Wanted HF linear or WHY or sell: £400. G4VNG not QTHR. (Peterborough) 0733 231639 anytime

● JST135 tcvr + BWC unit NBD520 PSU/spkr mic, manuals, new Jan 1990. Mint. Exch Icom IC761 tcvr or IC720A tcvr. Both must be mint cond with FM mic, manuals, boxes, prefer 1 owner options. No mods. GW4RLP QTHR. (Caernarfon) 0286 5264 eve

● STANDARD C58 all-mode scanning 2m portable, s/case, duck, whip, chrgr. Want scanning 2m FM mobile or sell: £200. (Somerset) 0458 250124

HELPLINES HELPLINESHELPLIN

HIGHSPEED MORSE?

Angela Sinton, G0HGA, is looking for a copy of the Candler Advanced Highspeed CW Course, either on loan or a photocopy (expenses paid). If you can help please contact her at 29 Hudson Road, Stevenage, Herts, SG2 0ER

CANADIAN 52 SET

Has anyone got tucked away any of the following: a complete/near complete tune/set/flick mechanism from a 52 set, a REME drawing of this complicated mechanism and a socket/plug for the DC lip fitted at the rear of the cabinet, or the bits of either. Mr Andrew Humphriss would be pleased to hear from you to restore his Canadian 52 set to near new condition. He can be reached at 'Polpeno', 21 Gould Road, Hampton Magna, Warwick, CV35 8TU, or on telephone 0926 400876.

ANOTHER 52

Paul Caswell, RS47464, is looking for an original ATU for a Marconi No52 set, which according to the reprint of the manual he has is a No 2A. Any other bits for this - other than the receiver - would be most welcome. His address is 78 Coldbath Road, Kings Heath, Birmingham, B13 0AO.

MOTOROLA UHF HANDHELD

David Cooper is seeking information regarding his Motorola UHF handheld tcvr (believed to be H1220); it is 2-channel, with a separate speaker mike and stub antenna, for a 70cm conversion. He particularly wants crystal layouts, what each coil does and how to tune up. He would also like details of the nicad cells used ie output power etc. You can reach him at 22 Kattorrig Place, Cramlington, Northumberland, NE23 9XP, tel: 0670 712514.

IZUMI HF TCVR

Glenrothes & DRC have been gifted a non working hf tcvr, a PAROS 22-TR made by the Izumi Co Ltd of Japan. If anyone has a circuit diagram of this Bob Smith, GM7GKT would be delighted to hear from you. Please write to him at 22 Elm Lane, Foresters Lodge, Glenrothes, Fife, KY7 5TD

CALLING ZB2G (1949-50)

Mike Steed, G3GOO (ex ZB2H) would like to contact John Torr, ex ZB2G (1949-50). If you know of his whereabouts please write to 5 Swallow Hill, Thurlby, Nr Bourne, Lincs, PE10 0JB.

SINCLAIR MICROVISION CIRCUIT DIAGRAM/MANUAL

Dave Barford, G8KBC wrote m recently requesting a circuit diagram/manuel for his olderly Sinclair Microvision - possibly the first model - about 10/15 years old. Recently the TV tube (actually a scope tube manufactured by AEG No D5/100WB) "blew itself to bits for no apparent reason and in so doing damaged some other part of the circuit, causing what looks like a video drive fault and, as the circuit board is so small I am not going to prod around until I get some info! or spare board?" Please contact Dave on 05216 539, 'Spen House', Sutton Road, Hutloft, Alford, Lincs, LN13 9RH.

GEC/MARCONI EXPERT REQUIRED

Mr Hemlall, RS36026, needs help to fix his GEC/Marconi RC410/411R. He has the manuals (1,2 and 3) and, although it functions on all modes when the servo motor drive to the RF and LO stage is disconnected and turned by hand, when connected it drives in one direction only to operate the micro switch and shut down. If anyone can help please contact Mr Hemlall can be reached at 11 Union Street, High Barnet, Herts, EN5 4HY, or tel: 01 440 3534.

EX-ARMY ATU

Perhaps someone can help Mr Wegg, G0LPT, to get his ex-army atu working. It is an ATU No5 for WS C12, cat No ZA43051 made in 1955 by Pye Ltd. If anyone has any tips or hints on how to get this working please get in touch with Mr Wegg at 23 Kerdane, Dane Park Road, Hull, HU6 9EB.

HQ MUSEUM

Does anyone have any vintage amateur radio equipment gathering dust and not wanted. John Crabbe, G3WFM, is helping to establish a small museum at RSGB HQ to illustrate Amateur Radio development through the decades and has collected some post WW2 items, but is very short of typical equipment from the WWI period, the twenties and the thirties. Transmitters and receivers for the amateur bands are the items he would most like to obtain, but realises they are probably most valuable now and rather rare. However they would be well cared for and stored in a very safe environment, so if there is anyone who would like to loan or give any items to the Society, we would be very interested to know. Please write to John at HQ first before sending anything so he can arrange collection.

OLD OSL CARDS REQUIRED

Bill Leyland, V3B2HI, has written in requesting help in tracing some of his late father's QSL cards. He operated under the callsign G8MV during the late 1940s and, if anyone can help him to obtain some of these cards, please contact him as he would be delighted to hear from you. His address is Mr WV Leyland, 2130 Patricia Avenue, Port Coquitlam, BC Canada.

CIRCUIT DIAGRAMS REQUIRED

Dave Greenhalgh, G0IWN, is looking for a circuit diagram to renovate his ageing broadcast receiver, His Masters Voice type 1125. It should cover LW, MW and SW, but only works on MW. Either a diagram or manbund set which he could strip for spares would be very gratefully received He is also looking for valves circa 1945 and the supplement to the 1945 RSGB Handbook. Please write to him at 8 Pleasant Road, Milton, Portsmouth, Hants, PO1 8JN, or tel: 0705 664966.

Geoff Southern requires a circuit diagram or workshop manual for a 'Sirius 1' or 'Vicki' computer. Any costs will be reimbursed. He is reached at 27 Eldred Road, Liverpool, L16 8NZ, or tel: 051 722 3184.

Lyn Collis, G4GJP needs circuit diagrams and any related information for her Eddystone S750 rcvr and Racal Electronic Frequency Counter Type 836, 32MHz. Any expenses would be paid for any photocopies, etc. Her address is Roughpiece Farm, Ashleyhay, Wirksworth, Darby, DE4 4AG. (0629 823934)

BIRMINGHAM UNIVERSITY AS

The above radio society is trying to find out some of its past history and has requested any past members to get in touch to try to fill in the various gaps in their records. The society callsigns are G3IUB and G8IUB. The person to contact is Mr K Webster, G7DWV, secretary of the RAD, Guild of Students, University of Birmingham, Edgbaston, Birmingham, B15 2TU.

VK3 AMATEUR NEEDS HELP TO FIND BOOKS

On behalf of a VK3 amateur Jim Cookson, G4XWD is trying to obtain the following publications: *International Radio Tube Encyclopaedia* 3rd Edition, 1958-59 or later by B Babani published by Bernards Ltd, London; *Secret Warfare* by Pierre Loram, Orbis Publishing; *C11 Transmitter Emers*. If you can help would you please write to him at 40 Oldnall Road, Kidderminster, Worcs, DLY10 3HW.

MARCONI MARINE EQUIPMENT WANTED

Two ex-sea going Radio Officers are collecting old Marconi Marine ships w/t gear to recreate typical merchant ship radio rooms. Obtaining old receivers is not a problem, but the old transmitters 'Oceanspan' and 'Reliance', 'Vigilant' auto-alarm, 'Autokey' and ancillary equipment seems to have totally disappeared. The search for old gear is given impetus because those are the last days of Morse code and the Radio Officer, with w/t coast radio stations going silent key. If you can help Bruce Morris, GW4XXF (0654 710741), and Norman Varnes, G3YXX (0963 32389) please contact them direct Both are QTHR.

TOTSUKO INF REQUIRED

Mike Fodan, G3UPA, would like to find a circuit diagram for the Totsuko TR2100M transceiver. Unfortunately the photocopy he has is totally unreadable in places and he would reimburse any expenses for a better copy. His telephone number is 0676 22767 (eve/weekends), 021 377 7000 (daytime).

WIRELESS WORLD ARCHIVES REQUIRED

Mrs Sheila Bourner is trying to trace copies of articles written by her late father, Charles Albert Carpenter, G5FM and G5HZ (experimental licence), who used to write for *Wireless World* and the Nottingham Guardian under *Wireless Whispers* circa 1920-36. Photocopies of these would be very welcome and all expenses would be paid. Please contact Mrs Bourner at Bella-Vista, 52 Comeytrowe Lane, Taunton, Somerset, TA1 5HY.

Helplines is designed to help put people in touch with each other. If you have a problem, it's more likely there's someone out there who has the solution; if you are looking for an old colleague or amateur friend, there could be a reader who has some news of their whereabouts; if you have solved a particular problem, write and tell the rest of us. 'Helplines' is there to help you and to give you the opportunity of helping others. While to us marking your envelope 'Helplines' and we'll do what we can to get the message out.

Mr HP Staunton, G8SXL, 6.12.89
Mr SA Gibson, G0KID
Mr RE Barrow, G4DET
Mr AF Dennis, G3CNV, 17.10.89
Mr J Wale, G3CQC, 26.12.89
Mr A Brook, G3XYM, 14.1.90
Mr AH Gutt, GM2BGH, 22.2.90
Mr WL McIntyre, GM3HMU, 21.2.90
Mr AEW Sheppard, G3JBS, 22.2.90
Mr D Crane, G0LRT, 12.2.90
Mr GO Edwards, G4BBB, 19.8.89
Mr CJ Teece, G4D8R
Mr J Heesom, G4FHL, 11.4.89
Mr D Bell, G4ILU, 7.9.89
Mr M Mason, G4POZ
Mr WAW Kemp, G6ITG, 10.8.89
Mr S Ince, G8LC, aged 87 years
Mr W Park, G6PIW, 8.8.89
Mr FW Munslow, G8DYC, 15.10.89, aged 75 years
Mr RLJ Winson, G8IWO
Mr B Wickham, G8WM, 30.10.89
Mr N Gregory, G3LCV, 27.10.89
Mr V Johnson, 9L1VJ, 11.9.89
Mr TM McKeown, GI3UHL, 27.5.89
Mr SB Caldwell, GI3YFY, 12.6.89
Mr JM Lowden, GI8MI, 3.9.89
Mr W McGonigle, GI3GXP
Capt JR Hunt, G3KQH
Mr WL Burt, G3TSB
Mr WH Martin, G3UWD, 3.2.89
Mr R Gidlow, G3ZFN, 26.5.89
Mr AE Ward, G3CAT, 10.9.89
Mr EA Lomax, G4DGR, 12.11.89
Mr GE Wilson, G4EAE, 10.9.89
Mr RJ Osborne, G4FJN
Mr D Penfold, G4IMR, 8.11.89
Mr WR Steverson, G3JEQ
Mr T Park, G4KVK, 21.10.89
Mr J Southward, G4MWV, 19.8.89
Mr JE Fielden, GW4NAH, 19.9.89
Mr SI Posen, G3NVD
Mr R Eastham, G4ORZ
Mr WH Jordan, G4THZ
Mr E Gray, G4TXH, 20.9.89
Mr B Bandy, G4UBA, 19.10.89
Mr IR Haberfield-Smith, G4ZCC, 12.10.89
Mr J Inness, G4AJP, 5.9.89
Mr P Tremaine, G8PB, 4.12.89, aged 72 years
Mr E Trobilcock, RS195
Mr DJG Bacon, RS30245
Mr PA Jones, RS46286
Mr C Bilsland, RS48746, 11.10.89
Mr JH Bailey (CPL), RS84697, 30.6.89
Mr JGE Camp, RS87823, 17.10.89
Mr GE Smythe, G3HZO
Mr FJ Bassett, G6HG
Mr W Docherty, G2BDQ
Mr GF Pell, G0FMV, 2.1.90
Mr AJ Jolly, GM4JML, 21.12.89
Mr PG Pennell, G3KME
Mr RF Warren, G3HWJ
Mr F Jeanmonod, G3JYT, 29.11.89
Mr EIR MacGregor, RS38609, 13.8.89
Mr U Smith, GW3UTI, 24.1.90
Mr H Allen, RS92345, 22.1.90
Mr B Woodward, G3BZJ
Mr M Butler, G7FJQ
Mr F Thompson, G5LH, aged 81 years
Mr R Patrick, G2BBX
Mr R Hammans, G2IG, 8.2.90
Mr MEW Hill, G4OFR, 2.2.90
Mr N Eddy, G4NEB, 6.1.90
Mr W Snodgrass, GI3CVH, 20.12.89
Mr ARP Jenkins, G0FIA, 19.9.89
Mr DC Thomas, GW0JZO
Mr W Bell, GW0KDM, 27.10.89
Mr K Burton, GI NNE, 26.10.89
Mr N Wolfenden, G1PRV, 19.9.89
Mr M Eckett, G1UIQ, 3.10.89
Mr EJR Butterfield, GI2UX, 26.1.89
Mr H Heath, G2AOK, 5.12.89
Mr PG Tandy, G2DU, 3.10.89
Mr FW Fletcher, G2FUX, 26.11.89, aged 81 years
Mr GD Davies, G2FXA, 30.10.89
Mr DE Beilby, G2HIK, 17.10.89
Mr A Kendrick, G2YX, 7.10.89
Mr MAE Brown, G3BZO
Mr LF Denzles, GM3DDE
Mr DD Gey, GW3DPO
Mr WL Middlemiss, G3EGG, 24.9.89
Mr A Owens, G3GXR
Mr WA Hawkins, G3JCV
Mr N Wright, GW4KGI
Mr CH Hall, G3GUU

This month I'll continue with the job of catching up with the enormous amount of gear which has come onto the market recently.

LINEAR AMPLIFIERS

Icom have just released their new HF model IC4KL, which gives a massive 1,000 Watts out on all HF bands. Like its predecessor, the IC2KL, it is completely solid state, and is compatible with all recent Icom HF transceivers. Band switching is automatic and ALC is provided. An automatic ATU is built in, and there is much circuit protection. The price is a mere £5,500 inc. VAT! At least this does include the PSU.

From Tentec comes the Hercules 2, which again is all solid state, and gives 500W out on HF bands. Unusually it runs on 13V, and needs a massive 100A on peaks, so it can be used mobile, but I hate to think what it will do to an average battery! It costs £839 and there is an accessory PSU which gives up to 120A, thus powering a typical HF transceiver as well. This costs £660. The linear has an internal ALC but does not have any external feed. It is fully metered and also has a row of LEDS. The linear measures 5.25 x 14.5 x 12 inches, and the weight is 15 lb. The PSU measures 12.5 x 12.5 x 9.25 inches, and weighs 58 lb.

BNOS will shortly be introducing a new range of wideband linears covering the frequency ranges 1MHz to 1GHz; 0.1MHz to 500MHz, and 500MHz to 1,100MHz. All the new models are classed as having linear operation. They are designed for one milliwatt input, and give outputs of 1W, 5W or 10W. Prices vary from £600 for 1W as an RF module, to £3,500 for 10W in a case with built-in PSU.

Piper Communications are the importers for two new powerful linears for 144 and 432MHz, made for SSB Electronics by ON5FF. The VI300 for 144MHz uses a 3CX800/A7 triode which gives 1kW out for 40W drive. It has a self-contained PSU. The similar 432MHz model is the U1000 giving 800W out for 40W input, and again using a 3CX800/A7 triode. The same company also released a 100W solid state linear for 1296MHz, having two temperature-controlled low-noise blowers, and requiring either 3 or 10W drive. It requires 25A at 13VDC, and includes an RF power meter, and RF sensed change-over, or can be controlled by PTT. This model can also power masthead preamps with 12VDC with sequential switching.

MULTIMODES FOR VHF AND UHF

The Icom range of transceivers for single band operation has gained a good reputation for having good facilities, and a welcome standard of performance. Icom (UK) Ltd now announce their IC 970 multimode base station with similar facilities, which includes both 144 and 432MHz, with the 1296 MHz band as an option. There is an optional general coverage RX covering 50 to 905MHz, having all the usual modes. A mains PSU is available, and modes include full duplex on two bands, and satellite auto tracking in either direction. Power outputs of 25 Watts are provided on 144 and 432MHz, and 10 Watts on 1296MHz. Mast head preamps can be fed with 12 VDC on Rx. The cost is £1995 at the time of writing. A high power "H" version should be forthcoming, and this "E" version is the first Icom multiband VHF rig with multimode facilities. The rig has 99 memories on each band, with extra ones for general coverage RX. I have the feeling that this new rig will be a trend setter, as many previous Icom ones have been.

HF TRANSCEIVERS

SMC tell us that the only new rig from Yaesu for five months or so is the FT 1000 model at the top end of the range. Basically, a mains rig, the transceiver gives some 200W output via its auto ATU. It has two separate VFOs and these allow two different frequencies on the same band to be monitored by mixing them together. An option includes separate RF input bandpass filters which will allow cross band mixing, and duplex operation with a separate antenna. Switchable IF filters of 250, 500, 2,000 and 2,400 Hz are provided as are two frequency and status digital displays, CW variable audio pitch, a dedicated packet mode position, and a general coverage RX with quite good AM filtering with sharp sideskirts. The rig has a direct-synthesis VFO, and seems an interesting new product.

HAND HELDS

Kenwood have announced two new models, the TH26e for 144MHz and the TH46e for 432MHz. They are very similar to the TH25e and TH45e, and have the same compatible accessories, the main differences being just cosmetic.

PREAMPLIFIERS AND ACTIVE ANTENNAS

Lowe Electronics are importing the new Dutch DX1 active antenna covering the range 50kHz to 50MHz. They are also marketing the German-made LMA 3000 low-noise pre-amp for masthead use covering the very wide range from 50MHz to 3GHz, at a cost of £112. Response is within 2dB over this range, and the average gain is 13dB, with a NFig of 1.8dB at 1GHz, and 3.4dB at 3GHz. The claimed intercept point is astonishingly high at +22dBm and it can be powered with 12VDC up the coaxial cable using a DC duplexer type DCC12 or with a separate lead. The masthead box is fitted with "N" plugs, and has U bolts. A very similar model is also being sold by Piper Communications, and made by Doever Elektronika.

Angus McKenzie, G3OSS

CLUB NEWS

DEADLINE - Items for inclusion in the July 1990 issue must be sent to HQ marked "Club News - DIARY", to be received by 23 May latest. If news is received by the published deadline, it will appear in the listing. It is your responsibility to ensure that items are sent DIRECT to HQ in good time. News items should be sent in writing, preferably typed or written legibly, and be signed by the club secretary or the person responsible for publicity.

AVON

▶South Bristol ARC - 2, talk "How to Use an Oscilloscope"; 9, HF activity evening; 16, construction evening; 23, microwave activity evening; 30, video activity evening & committee meeting; Jun 6, film & slide "Bring & Show" evening; 13, "Bullseye" contest with NBARC; 20, briefing for Longleat Rally.

▶Thornbury & DARC - 2, talk "Amateur Satellites" by Ted, G3JMY; 18, HF activity evening; Jun 6, foxhunt; 20, HF activity evening

▶Weston-Super-Mare RS - 14, talk "Tracking the Bismark by Radar" by Cliff Brent, G2BFI. There is no constructors night in May.

BEDFORDSHIRE

▶Dunstable Downs RC - **'NEW SECRETARY'** Mr. M. Spacey, 54 Dovehouse Hill, Luton, Beds. Tel: 0582 30664.

▶Shefford & DARS - 3, talk "Looking Forward to Competitive Radio" by Dick, G3WRJ. Details 0767 80043.

BERKSHIRE

▶Maidenhead & DARC - 15, preparations for HF Field Day.

▶Reading DARC - 10, talk "Amateur Satellites and Their Use by Radio Amateurs" by G1HBD; 24, HF NFD organisation chaired by G4THN; 24, HF NFD Organisation chaired by G4THN. Details 0734 744642.

BUCKINGHAMSHIRE

▶Aylesbury Vale RS - 2, talk "Electrical Safety in the Shack" by Dick Bacon, G3WRJ; 16, talk "Reception of Different Types of Weather Transmissions" by Martin Stubbs of the Met. Office. Details 0280 81 7496 or 0908 560026.

▶Home Counties TV Group - 22, talk on "Path Loss". Details 0494 445972.

CHESHIRE

▶Stockport RS - 9, talk "Vertically Polarised Antennas" by Andy Paterson, G0HAL; 23, NFD preparation/night on the air. Details 061 439 3831 or 061 439 4285

CLWYD

▶Delyn RC - 8, preparation for monitoring of the Annual Delyn Walk across Halkyn Mountains; 13, monitoring of the Ninth Delyn Walk across the Halkyn Mountains; 22, talk "Abroad in the USA" by Derek Rogers, GW3UOO; Jun 5, talk about the work of the Animal Rescue Service; 19, The Chairman's Night. What has he got up his sleeve?

CORNWALL

▶Cornish RAC - 3, CRAC main meeting; 8, radio constructors workshop; 14, computer club; Jun 7, CRAC main meeting; 11, computer club; 12, radio & constructors workshop.

▶Newquay ARC - 9, foxhunt. Meet at St. Columb Roundabout at 7.15pm; 13, car boot sale & jumble sale at Treviglas School at 10.30am. Details 0637 871598.

DERBYSHIRE

▶Buxton RAS - meet second Tuesday each month at 8pm, Leewood Hotel, Buxton. Details 0298 25506.

▶Derby & DARS - 2, junk sale; 9, talk "TVI and BCI - Its Cause and Cure" by Derek Brumbill; 16, technical topics; 23, visit to the new BBC Radio Derby studios; 30, night on the air; Jun 6, junk sale; 13, barbeque at Drum Hill, Little Eaton. Details 0332 569157.

DEVON

▶Exeter ARS - 14, talk "Microwaves" by Chuck, G0MDK; Jun 11, surplus sale.

▶Sidmouth ARS - **'NEW SECRETARY'** R.E. Hamson, G8NFK, 43 Arcot Park, Sidmouth, Devon. EX10 9HU. Tel: 0395 515349. Meets at the Norman Lockyer Observatory, Salcombe Hill, Sidmouth on the 2nd and 4th Tuesday of each month at 7.30 pm.

DORSET

▶South Dorset RS - 1, SDRS meeting. Beginners evening. All are welcome; 12, RSGB VHF Convention at Sandown Park.

ESSEX

▶Chelmsford ARS - 1, mini lectures by club members; Jun 5, constructors competition.

▶Loughton & DARS - 4, night on the air - G4ONP on 6m from Loughton Hall; 18, Aylmers Farm planning night; 25-27, Aylmers Farm Field weekend; Jun 1, map reading; 15, top band DF hunt.

FIFE

▶Glenrothes & DARC - 2, talk "Test Gear - Signal Generators" by GM4ALA; 9, GM4ZNG video on Ingolstadt; 16, talk "Electronic Make-up of Computers" by GM3VZF.

GREATER LONDON

▶Acton, Brentford & Chiswick ARC - 15, talk "Short Wave Broadcast Listening" by G0LZB.

▶Coulsdon ATS - 14, open evening with cheese & wine - demonstrations of radio etc; Jun 11, 'Infamous' G6YDG DF Hunt - Mike Rutt.

▶Edgware & DARS - 10, talk "Masts and Rigging" by G3SJE; 18, straight key evening; 24, constructors contest & NFD briefing; Jun 2/3, NFD Contest weekend.

▶Southgate ARC - 10, talk "History of Valves" (Part 5) by Marconi Historian, Stan Wood; 24, rig diagnostic evening.

▶Sutton & Cheam RS - 1, committee meeting; 12, VHF National Convention at Sandown Park; annual dinner at the Stoneleigh Inn, Stoneleigh; 18, Annual General Meeting; Jun 2/3 HF National Field Day

▶Wimbledon & DARS - 11, construction contest; 25, talk "Wireless before Radio" by Steve, G8CYE; Jun 8, joint meeting at home with Sutton Library Computer Club. Details 01-330 2703.

GREATER MANCHESTER

▶Eccles & DARS - 1, talk "Going Stateside" by G6FEI; Jun 5, demonstration "SWR Measurements" by G8ZZF. Details 061 773 7899.

▶Greater Manchester Police ARS - Meets at Tyldesley Police Station and is open to members of Greater Manchester Police Sports & Social Club and families and retired members of the Force. 20, special event station for Wigan Open Day. Details from Bryan Bradshaw, G0LVJ (Sec) QTHR.

▶South Manchester RC - 4, contest preparation night - club open for non contesters; 11, talk "Frequency Stable UHF Signal Source" by G3SVW; 18, Annual General Meeting.

HAMPSHIRE

▶Basingstoke ARC - 20, direction finding foxhunt OS map 185, 2 metre FM channel S17.

▶Fareham & DARC - 9, talk "The Sinclair" by Andrew, G0AMS; 23, talk "Once Upon a Time" by Len, G6NZ; Jun 6, talk "Computer Programs for the Radio Amateur" by Andrew, G0AMS; 20, The Noise Bridge (Project) by Mick, G4ITF.

▶Farnborough & DARS - 9, special open evening; 23, HF Field Day preview and planning; Jun 13, Silver Jubilee construction contest.

▶Horndean & DARC - 3, visit to Copnor Fire Station; Jun 7, talk "Roll Your Own".

▶Liphook (Three Counties ARC) - 9, talk "A Short History of Telegraphy" by Smudge Lundegard; 23, junk sale; Jun 6, talk "QE2 Wireless Room" by Phil Williams; 20, club night for your own activities.

HEREFORD & WORCESTER

▶Bromsgrove ARS - 8, Annual General Meeting; 22, night on the air.

▶Hereford ARS - 4, talk "Jandek Kits" by L... ek Pearson, G3ZOM; 18, NFD preparation and talk "Packet Radio" by Don, G3FKH; Jun 1, talk "ATUs/Matching" OR "Expedition to Sheetholm Island"; 2/3 National Field Day.

▶Malvern Hills RAC - 8, talk by John Layton, G4AAL. Details 0684 573558.

▶Redditch RC - 10, talk and demonstration "VHF Antennas" by Derek Bedford, G4ABS.

HERTFORDSHIRE

▶Cheshunt & DARC - 2, talk "Radio - The Latest Trends" by Peter Clarke of Arrow Electronics; 16, portable evening - Baas Hill Common, Broxbourne; 30, NFD briefing; June 2/3, NFD CW Field Day and BBQ Herts Young Manners Base, Windmill Lane, Cheshunt; 13, TBA.

▶Stevenage & DARS - 2, talk and demonstration "Slow Scan Television" by Tony, G1ZZH; 16, talk "Reading EPROMS" by Mo, GI ZOO; 23, committee meeting 81 Whomerly Road. Details 0438-724991.

▶Verulam ARC - 22, talk "AKD Amateur Radio Equipment" by Mr. J. Armstrong. Details from Hon.Sec (G8BZS) or Publicity Officer (G3PMF).

▶Welwyn-Hatfield ARC - 21, NFD preparation; Jun 4, Bar-B-Q

HUMBERSIDE

▶Hornsea ARC - 2, Fernby Club visit Hornsea; 9, committee meeting; 16, talk "Omega, Further Revelations" by Richard, G4YTV; 19/20, 2M contest; 23, talk "Power Factor" by Rick, GI YVL; 30, HF Field Day preparation; Jun 2/3, HF Field Day; 6, HF Field Day inquest; 13, Survey of Old East Yorkshire Contest Sites. Details 0964 53333.

KENT

▶Bromley & DARC (formerly Biggin Hill ARC) - 15, AR quiz.

▶Maidstone YMCA ARS - 1, Morse test dummy run; 4, CW tuition and RAE; 11, talk "Simple VHF Antennas to get you on the Air" by Keith, G4YTU; 12, Morse test in the Club Shack; 18, CW tuition and RAE; 25, audio tapes in Balcony Room, made and sent by George, VK5QG from Australia. Details 0622 878778

▶South East Kent (YMCA) ARC - 9, 144MHz foxhunt, 23, Waldershare Vintage Weekend (GB2WVW) Planning; Jun 13, Dick's choice.

LANCASHIRE

▶Lancaster University ARS - 14, talk by G4UWG; Jun 11, talk "Satellites" by G8TZJ. Details 0524 64239

LEICESTERSHIRE

▶Leicester RS - 1, HF/VHF activity night; 8, committee meeting and HF/VHF activity night; 15, talk "Digital Circuits"; 22, HF NFD final arrangements; 29, HF/VHF night on the air.

LINCOLNSHIRE

▶Stamford & DARS - Meets at 7.30pm on the 1st and 3rd Wednesday each month at a new venue - The Flat, Marshall's Garage, St. Paul's Street, Stamford; 7, visit to HQ 10th Tactical Fighter Wing (USAF), RAF Alconbury. Details 0780 55001

LOTHIAN

▶Lothian RS - 9, talk "Home Construction" by Alf Lowe, GM4UZP; 23, DF hunt; Jun 13, Annual General Meeting

MERSEYSIDE

▶Wirral & DARC - 9, talk "Raynet, the Amateur Radio Emergency Service"; 23, project night - The BSX Packet Box; 30, practice DF hunt, from Heswall Lay-by, 8pm; Jun 13, talk "SMD Construction for Amateurs" by Bill Mooney, G3VZU.

NORFOLK

▶Norfolk ARC - 2, club visit to BBC Transmitter Site at Tacolneston; 9, first HF NFD briefing; 16, GB3NB Repeater AGM, 23, talk "Amateur Radio on a Shoestring" by Rev. George Dobbs, G3RJV; 30, final HF NFD briefing; Jun 2/3 HF NFD at Cart Gap, Happisburgh; 6, "Real Radio" evening; 13, talk "Slow Scan TV" by Robert Scarle, G4TUK. Details 0508 78258.

▶Yarmouth RC - 10, caravan maintenance party; 24, NFD planning session; Jun 2/3 NFD - YH Racecourse. Details Yh 721173.

NORTHAMPTONSHIRE

▶Northampton RC - 10, construction contest; 24, walking DF; Jun 14, mobile DF.

NORTH YORKSHIRE

▶Scarborough ARS - 14, talk "Antenna Tuning Units" by Kevin, G0EBL; 21, final preparations for the 1990 National Field Day Competition.

NOTTINGHAMSHIRE

▶Mansfield ARS - 3, Annual General Meeting; 17, talk "Foxhunt equipment".

▶Worksop ARS - 8, talk "Contests" by Bill, G3ZVG; 13, visit to Drayton Manor Park; 22, visit from BNFL Sellafield; Jun 5, foxhunt.

SHROPSHIRE

▶Salop ARS - 10, junk sale at the Beachamp; 24, second foxhunt.

▶Telford & DARS - 2, club station on VHF; 9, quiz night; 16, HF NFD preparations. Details Telford 770922.

SOMERSET

▶Yeovil ARC - 10, talk "The Z Match ATU" by G3MYM. RAE course starts; 13, 6th QRP Convention at the Preston Centre, Yeovil; 17, talk "Smith Chart - Analysis of the G5RV Antenna" by G3MYM; 24, talk "Analysis of a QRP Record" by G3MYM; Jun 7, talk "Product Detectors" by G3MYM. Details from David Bailey, GI MNM, QTHR.

SOUTH GLAMORGAN

▶Cardiff RSGB Group - 14, talk "Aanals" by Ross Clare, GW3NWS; Jun 11, general discussion on members' technical problems.

STAFFORDSHIRE

▶Stafford & DARS - 8, night on the air; 15, talk "Semi-Conductors" by G3EHM; 22, construction evening; Jun 12, night on the air; 19, used and surplus equipment auction. Details 0785 662350.

SUFFOLK

▶Felixstowe DARS - 14, ESWR planning (Ferry Boat Inn); 27, East Suffolk Wireless Revival; Jun 11, visit to The Suffolk Ambulance Centre; 17, DF hunt & barbeque. Details 0473 642595 (daytime).

▶Leiston ARC - 1, talk "Construction of Simple Microwave Sources" by Sam Jewell, G4DDK. Details 0728 830791.

SURREY

▶Dorking & DARS - 8, Informal - Falkland Arms; 20, visit to Singleton Open Air Museum; assembled entrance 11.00 - further details from John, G6ZOV; 22, talk "The RSGB and Future of Amateur Radio" by David Evans, G3OUF, Secretary and Chief Executive, RSGB - at Falkland Arms; Jun 12, D/F Trial, organisers Chris, GIPXH and Nick, G7DND. Assemble 7.30pm; start venue TBA.

▶Guildford & DARS - 11, quiz night

▶Reigate ATS - 15, talk "Planning Permission" by Roy Hill, G4HLH; Jun 19, surplus equipment sale.

TAYSIDE

▶Dundee ARC - 8, construction; 15, talk "The Linear Amplifier" by Findlay Baxter, GM3VEY; 22, construction; Jun 23, special event station - venue Wellgate Centre, Dundee.

WARWICKSHIRE

▶Mid Warwickshire ARS - 8, talk and demo "2m DF-ing Made Simple" by Malcolm, G0GLU; 22, talk "HF Antennas for You" by Neil, G3OAY; Jun 12, 2M DF foxhunt, 145.350 horiz FM, 7pm start TX.

▶Rugby ATS - 8, 3rd annual construction competition; 15, vintage wireless night; 22, 144MHz direction finding competition round one, Jun 5, aerial rigging demonstration.

▶Stratford upon Avon & DARS - 14, visit to Eddystone Radio, Jun 11, Community Radio (provisional).

WEST MIDLANDS

▶Coventry ARS - 4, 2M direction finding contest; 11, Dr Best - CAIRO (provisional); 18 night in the air (gliding) - provisional; 25, night on the air and Morse tuition.

▶Midland ARS - 15, rally debrief; Jun 19, treasure hunt.

▶South Birmingham RS - 2, TBA; 5/6, contest, 432MHz to 24GHz. UHF/SHF, Shenlow Hill. Also: 432MHz trophy competition - from shack if equipment is available; 13, Drayton Radio Rally; Jun 6, rig check night.

WEST YORKSHIRE

▶Halifax & DARS - 15, bits and pieces; Jun 19, antennas - members' discussion evening.

▶Keighley ARS - 15, annual foxhunt; 29, talk "Air Traffic Comms & Navig Aids" by R. Evans.

•Spen Valley ARS - 3, surplus equipment sale; 17, demonstration "Chassis Bashing" by Tim Clough, G4PHR; Jun 7, foxhunt, 2M direction finding contest. Details 0274 875038.

•Todmorden & DARS - 21, talk "Magistrates Court" by Trevor Driver; June 4, bits and pieces.

WILTSHIRE

•Ridgewey RG - 23, Annual General Meeting, 7.30pm at North Wiltshire Centre for the Curriculum, Drove Road, Swindon.

MOBILE RALLIES

This is a list of all rallies, exhibitions and conventions notified to HQ (as at press date). Items are given in detail for the next three months inclusive and in brief thereafter. Please send detailed information, including contact callsign and telephone numbers direct to HQ and marked 'Rally News - DIARY'.

6 MAY

•7th Anglo Scottish Rally - Tait Hall, Kelso. Details from Bruce, GM4UIB, DTHR.

7 MAY

•Mid Cheshire ARS Rally - Civic Hall, Winsford. Doors open 11am (10.30 for disabled visitors). Full catering and ample car parking. Details from David, G4XUV, tel. 0606-77787.

13 MAY

•Drayton Manor Mobile Rally - Drayton Manor Park, near Tamworth, Staffs. Details from Norman, G8BHE, tel. 021 422 9787.

19 MAY

•Swindon Radio Rally - Oasis Leisure Centre, North Star Avenue, Swindon, Wilts. Doors open 10am. Ample parking. Refreshments. Bring & Buy. Talk-in by Raynet S22: Admission £1 adults, 25p children. Sports facilities available including Lagoon Pool with wave machine. Details from Jim, tel: 0793 611859 or John, tel: 0793 619014.

20 MAY

•Cambridge & DARC 5th Annual Rally and Radio Car Boot Sale at Coleridge Community College, Radegund Road, Cambridge. Opens 10.30 (traders 8.30). Talk-in on S22. Details from Brian, G4TRO, tel: 0223 353664.

•Dunstable Downs RC 7th National AR Car Boot Sale - Stockwood Park, Luton. This venue is near Junction 10 on the M1. Details from Clive, G4ENB, tel: 0582 27907.

•33rd Northern Mobile Rally - Flower Show Hall, The Great Yorkshire Showground, Harrogate. Showground open 10am, doors open 10.30am. Talk-in on S22 2M. Cafeteria Bar. Car parking and entry is from Railway Road off the Wetherby to Harrogate road. Separate arrangements made for disabled visitors with parking and entry near to the Hall and close by the Crimple Valley Golf Club in Hookstone Wood Road. Details from Mike, G0MKK, tel: 0423 564353/507653.

•Mid-Ulster ARC PARKANAUR Rally - Silverwood Hotel, Lurgan, Co. Armagh. Open 12 noon. Entrance fee £1; Usual trade stands. Bring & Buy. Bookstall. QSL Bureau. Talk-in S22 145.550. Proceeds of this rally go to the Stanley Eakins Memorial Fund at Parkanaur. Details from Jim Lappin, GI1YGS, tel. 0762 851179.

27 MAY

•14th Annual East Suffolk Wireless Revival 1990 - Civil Service Sports Ground, Straight Road, Bucklesham, Ipswich. Indoor Bring & Buy. Car Boot Sale. Bookstall. 50 MHz Demonstration station; Vintage Radio Display BYLARA, RAIBC, Scout Radio, RAYNET stands. Children's play area; Model flying display. Details from Paul Whiting, G4YOC, 77 Mallard Way, Felixstowe, Suffolk, tel: 0473 642595.

•Plymouth Radio and Electronics Fair - Plymstock School, Church Road, Plymouth. Doors open 10am. Usual traders. RSGB Zonal Meeting. Morse Tests. Bring & Buy. Refreshments. Talk-in S22. Details from Jon Fisher, G0IVZ, tel. 0752 340946 evenings/weekends.

28 MAY

•Bircotes Radio Rally - near Bawtry, Doncaster. Doors open 11am, 10.30 for disabled visitors. Talk-in S22. Booking forms/details 23 Florence Avenue Balby, Doncaster. Tel: 0302 857526.

3 JUNE

•British Telecom (S. Wales District) ARS 2nd Annual Radio Rally - BT Headquarters, Corylon, Cardiff, Bar, Restaurant, Bring & Buy etc. Bring & Buy stall display fee £1 per item. Entrance fee £1 per person and 50p for OAP and children under 14. Talk-in on S22. Details from Martyn Jenkins, GW7EYP, tel: 0222 379634 (office hours).

•Southend & DARS Mobile Rally at Rochesway Youth Centre, Rochford Essex. Details from John Stone, G6DFE, tel: 0702 202216.

•Spalding & DARS Mobile Rally. Springfields Arena Spalding. Details from T. Kettlewell, G4TWR, tel: 0775 722940

10 JUNE

•21st Elvaston Castle Mobile Radio Rally, Elvaston Castle Country Park near Derby. Technical Bookstall. Bring & Buy. DTI Exhibit. Craft Marquee. Arena attractions throughout the day. Catering. Talk-in on 144 & 432MHz. Car parking £1, coaches £2. Admission to rally activities is free. Details from John, G4PZY on 0332 767994. Trade enquiries from Peter on 0332 700265 (evenings).

•Norfolk Raynet Annual Rally, Barford Village Hall, 5 miles west of Norwich. NGR: TG 113078. Opens 10.30am. Local traders. Bring & Buy. Car Boot Sale etc. Details from 0603 667189 (daytime) 0692 650865 (evenings).

•Royal Navol ARS 30th Annual Mobile Rally - HMS Mercury, Nr. Petersfield, Hants. Trade, RSGB, RAIBC, BARTG and RAYNET stands. Crafts exhibition, Have-a-go archery, Radio controlled power boats, helicopters, cars and trains. County Sound Radio Mobile Rig. Refreshments. Morris Dancers. Many other attractions. Talk-in on 2m and 70cms. Details 0703 557469.

17 JUNE

•Denby Dale Rally - Salendine Nook School, 2 miles west of Huddersfield on A640. Opens 11.00am (10.30 for disabled visitors). Usual good food. Ample parking. Traders. Talk-in S22 and SU22. Details from G3SDY, tel: 0484 602905.

•Newbury & DARS Car Boot Sale - Recreation Field and Acland Village Hall, Cold Ash, Newbury, Berks. Opens 10am. Free admission and car parking. Talk-in on S22. Refreshments and children's play area. Details from Mike, G3VDW, tel: 0635 43048

24 JUNE

•City of Bristol Group 33rd Longleat Amateur Radio Rally, Longleat Park, Warminster, Wilts. Details Shaun O'Sullivan, G8VPG, tel: 0225 873098.

1 JULY

•Worcester & District Droitwich Strawberry Rally - High School, Droitwich. Opens 11am. Usual trade stands. Bring & Buy. Family entertainment and Strawberry Fields (weather permitting). Free car park and free entrance. Details from Tony, G4DPD, tel: 0905 620507 or Derek, G4RBD, tel: Worcester 641733.

•York Radio Rally - Tottersall Building at York Race Course. Ground and First Floors will be used. First floor accessible by wide stairs, lift and escalator. Roller doors will provide loading facilities for traders. Ample parking for traders and visitors. Talk-in on S22 and GB3CY on RB13. Details tel: 0904 625798.

14 JULY

•Cornish RAC Rally - Richard Lander School, Truro. Doors open 10am (9.30 for disabled visitors). Usual trade stands. Bring & Buy. Computer display/demo. Weather satellite demo. Refreshments. Free parking. Details from Rod Little, G7FKR, tel: 0872 72554.

22 JULY

•Burnham Beeches and Maidenhead & DARC McMichael Rally. The Haymill Centre, Burnham near Slough. Doors open 10.30am (10.15 for disabled visitors). Admission fee £1. Car boot sale admission £5 for car and driver. Usual traders. Royal Naval ARS. Datacomms Symposium. Packet radio demo. Refreshments. Bar. Details from Bob Hearn, G6BTY, tel: 0494 29868.

29 JULY

•Rugby ATS Amateur Radio Car Boot Sale - Lodge Farm., Walcote, Nr. Lutterworth, Leicestershire. It is less than 2 miles east from junction 20 of the M1. Opens 10am. Entrance fee to non stall holders 50p per car. Pitches £5.00 for whole day. Talk-in GB8CBS on S22. Details from Kevin, G8TWH, tel: 0203 44159 or Dowd, G4DDW, tel: 0455 552599.

•Scarborough ARS Rally - The Spa, Scarborough. Doors open 11am. Many trade stands. Bring & Buy. Morse exam and demo from Morse Examiners. Refreshments and Bar. Details from Ian, G4UQP, tel: 0723 376847.

5 AUGUST

•Woburn Rally - Woburn. Details from RSGB.

12 AUGUST

•Derby Mobile Rally - Lower Berrrose School, St Alban's Road, Derby. Details from Kevin Jones, G4FPY, 20 Pinecroft Court, Oakwood, Derby DE2 2LL. Tel: 0332 669157.

•Flight Refuelling Hamfest - Flight Refuelling Sports Grounds, Wimborne, Dorset. Details from John, G0API, tel: 0202 691649 or Rob, G6DUN, tel: 0202 479038

19 AUGUST

•Royal Forest of Dean, Glouc, Speech House Rally. Details from Terry, G4HZT DTHR, tel: 0594 33334 (mid evenings).

•West Manchester RC Red Rose Summer Rally - Bolton Sports & Exhibition Centre, Silverwell Street, Bolton. Details from Dave, G1IOO, tel: 0204 24104 (evenings only).

26 AUGUST

•Torbay ARS Mobile Rally - STC Social Club, Brixham Road, Paignton, Devon. Details G3HTX QTHR.

2 SEPTEMBER

•Preston ARS 23rd Annual Rally - University of Lancaster. Details from Godfrey, G3DWD, tel: 0772 53810.

•Telford Radio Rally & Exhibition - Telford Exhibition Centre, Telford, Shropshire. Details from G3UKV, QTHR, tel: 0952 255416.

9 SEPTEMBER

•Vange ARS Annual Rally - The Lalndon Community Centre, Aston Road, Lalndon, Basildon, Essex.

16 SEPTEMBER

•Bristol Radio Rally - Brunel's Great Train Shed, Temple Meads Station, Bristol. Details from David Farr, G4WUB, tel. 0272 839855.

•BARTG Rally - Surrey Hall, Sandown Park Race-course. Details from Mr. Peter Nicol, G8VXY, 38 Mitton Ave, Rubery, Rednal, Birmingham B45 0JB. Tel: 021 453 2676

30 SEPTEMBER

•Harlow AR & Electronics Mobile Rally - Harlow Sports Centre. Details from Alf, G7FNY, tel: 0279 418392 (weekdays) or Mike, G7BNE, tel: 0279 722569 (evenings and weekends).

•6th North Wakefield R.C. Rally - Outwood Grange School, Potovens Lane, Outwood, Nr. Wakefield. Details from Richard, G4GCX on 0532 622139

7 OCTOBER

•Armagh & Dungannon DARC Annual Rally - Drumsill House Hotel, Moy Road, Armagh. Details from T.E. Hall, GI0MSJ, tel: 0861 523454

•Blackwood AR Rally - Oakdale Community College, Blackwood, Gwent, NP2 0DT. Details from B. Matthews, GW0JWF.

•Great Lumley Radio Rally - Community Centre, Great Lumley, Nr. Chester-le-Street, Co. Durham. Details from Barry, G1JDP, tel: 091 388 5936.

•South Devon RC, Sixth Annual Ham Radio Computer Exhibition and Rally - Hillhead Campsite on the Dartmouth Road in Brixham. Details from 0803 522216

21 OCTOBER

•4th North Wales Radio Rally - Aberconway Centre, Llandudno. Details from E. Shipton, 34 Argoed, Chester Avenue, Kinmel Bay, Rhyl, Clwyd LL18 5AY, tel: Rhyl 336939.

11 NOVEMBER

•MARS Birmingham Mini Mobile Rally - Stockland Green Leisure Centre, Erdington, Birmingham. Details from Norman, G8BHE, tel: 021 422 9787.

18 NOVEMBER

•West Manchester RC Winter Rally at Bolton Sports and Exhibition Centre, Bolton. Details from Dave, G1IOO, tel:

0204 24104 (evenings only)

•Bridgend & DARC Annual Rally - Bridgend Recreational Centre. Details from Don, GW3RVG, tel: 0656 860434 after 5pm.

27 JANUARY 1991

•University of Lancaster ARS & Central Lancs ARC. The Lancastrian Rally - Lancaster University. Details from Sue Griffin, G1OHH, tel: 0524 64239 or Mike Sherlock, G4ZYN, tel: 0257 452287.

OTHER EVENTS

6 MAY

•BATC Convention, Herlaxton Manor, Nr. Grantham. Details from Paul Marshall, G8MJW, tel: 0522 703348.

12 MAY

•R5GB VHF Convention - Sandown Park Racecourse. Details from Geoff Stone, G3FZL, tel: 01-699-6940. (See page 23).

13 MAY

•Yeovil ARC 6th DRP Convention - Preston Centre, Monks Dale, Yeovil. Doors open at 10am by Editor of Practical Wireless, G3XFD. Talks during the day by GM3OXX, G3RHI, G3MYM & G3PCJ. GB3LDW will be on the air all day also for talk-in station. Traders as in previous years. Refreshments served from 9am. Further details D. Bailey, Hon.Sec., QTR or P. Burridge, Chairman, tel: 0935 81 3054.

2 JUNE

•RAIBC (Northern Ireland Area). First Belfast Amateur Radio Convention - Ormeau Park Recreational Centre, Ormeau Embankment, Belfast. Commencing 12.30. Usual attractions. Demonstrations and talks on the hobby. Demonstrations on Microwave Cookery. Crafts and First Aid by Red Cross. Talk-in on S22. All the proceeds to go to the Northern Ireland Area to buy equipment for Club members in Northern Ireland. Details from David Caldwell, GI0HOW, tel: 0232 471370.

10 JUNE

•Mid Lanark ARS Annual Open Day. Usual traders. Packet Radio will be in attendance. Talk-in on S22. Details from David Williams, GM1SSA, 32/32 Carfin Street, New Stevenston, Motherwell ML1 4JL. Tel: 0698 732403.

17JUNE

•Eighth Annual Practical Wireless 144MHz DRP Contest. 0900 - 1700 UTC. Transmitter output power will be limited to 3 watts as usual. Full rules will be published in due course in Practical Wireless. Contest adjudicator: Neil P. Taylor, G4HLX.

1 JULY

•Newport ARS 3rd Grand Surplus Equipment and Junk Sale, Bryngias Community Education Centre, Bryngias Road, Newport. Details from Kevin, GW7BSC, tel: 0633 262488 or 800. GW4IED, tel: 0633 280858.

8 JULY

•RAIBC Ramsey Picnic - the Fairground, Broadlands, Ramsey. All usual attractions. Free parking and entry. Mammoth junk sale. Grand Draw. Refreshments. Talk-in on S22. Details from John, G4COM on 0703 693017.

15 JULY

•Sussex Amateur Radio and Computer Fair (formerly the Sussex Mobile Rally) - Brighton Racecourse. Details from Ron Bray, G8VEH (QTHR), tel: 0903 763978 or 0273 415654 (office hours).

15 SEPTEMBER

•Scottish Convention - Cardonald College, Glasgow. Details from GM3EDZ.

30 SEPTEMBER

•RSGB HF Convention. Details from G3ZAY.

26/27 OCTOBER

•RAF ARS Annual General Meeting - RAF Cosford. Further information from Warrant Officer M.J. Street; tel: Albrighton 2393, extn 2472.

the last...

G-PLATES

With regard to 'G' single figure number plates. As we do not know the final decision from the DoT, may I suggest that if we are to be offered the chance to 'purchase' a callsign, it should also work in reverse, ie, if the radio amateur does not want his callsign released, his wish should be respected.

I can think of no worse situation than seeing your own callsign on someone else's vehicle and not being able to afford it for yourself!!

Does this mean that if I put my callsign on my rear window (not very advisable), I would be breaking the law?

I know this is a well roasted chestnut, but I am sure many, if not all, radio amateurs feel the same!!

P A Caldwell, G4PAC

PS: Congratulations on the new look *RadCom*!!

RadCom, CALL BOOK, AND GB2RS

May I be permitted to bring to notice my observations, but not criticisms, and offer my suggestions to benefit readers :-

(1) Provide more space for *Last Word* letters as opposed to the childish cartoons which are out of place, in my opinion, in *RadCom*.

(2) Reinstate the publication of Special Event Stations each month (not appeared in last three issues), with original FULL details that was a feature over the past years. I try to work all such stations, but only certain important SES details are given out on GB2RS News, thus I do not know to what to listen for. I feel reinstatement is of priority

(3) I propose the new Call Book is typeset in a more legible type, especially the callsign. The present printing is very much blurred, possibly by the litho offset plates becoming worn out by excessive over-printing from a worn such plate, also increasing use of 'particulars withheld', it could lead to an eventual book full of such; use postal code in lieu.

(4) Repeal GB2RS News headlines at close as well as at beginning for those missing the start.

Many thanks - good well-printed RadCom - keep up the good work.

F D Webb, G2HBC

[What the readers think about points 1, 2 and 4? As for the RSGB Call Book, Mr Webb should be pleased with the 1990 edition just published as it contains more information, more clearly presented. - Ed]

NORTH POLE 90 EXPEDITION

I would like to congratulate the Society on its involvement with the Multiple Sclerosis Society's Research Chair Appeal. I think it is the first time that an appeal for a non-amateur radio cause has ever been carried by RadCom, and I hope that all members will lend their support.

MS is a particularly pernicious disease. It is not generally appreciated that apart from its direct physical effects on the young adults which it typically chooses as its victims, it can have equally disastrous effects on personal relationships.

As the husband of a sufferer, I have been lucky to have a marriage strong enough to survive the stresses. I have also been able to make adjustments to our way of life which have minimised the disruption. But it has meant the loss of a few dreams. Members with longish memories may remember that one of the chief reasons for our decision to wind-down the operations of Mutek Limited prior to its sale to Mike Dorsell, and my move into freelance rf design and consultancy, was Jane's illness.

Other sufferers of my acquaintance have not been so lucky. The divorce rate for MS sufferers is very much higher than the mean.

So please do not sit there waiting on top band, two metres or whatever, about what a good idea the expedition is and how brave the people taking part are. Send an SAE to Headquarters for a sponsorship form TODAY. You might not only help in finding a cure for the disease; you may also help in saving MS sufferers and their families a lot of unhappinesss.

Chris Bartram, G4DGU

HAPPY FAMILIES

Recently, I successfully completed the requirements for the 'Worked All Scottish Districts' Gold Award, namely, to make radio contact with each of the fifty-six designated districts of Scotland.

I have been a licensed amateur for only three years, and this was the first award I had ever worked for. I really did not expect the overwhelming encouragement and outstanding cooperation I received from the Scottish radio amateurs, as well as others in all parts of the UK. Once they learned of my district needs, some went mobile for me, while others contacted fellow hams in the needed districts and arranged for them to meet me on frequency. Still others offered helpful advice, or checked in with me whenever I was on the bands, to see how I was doing. I really felt like part of a big, happy family.

More importantly, I met a lot of fine folks on the air and made many new friends. I hope to visit Scotland with my family in the near future to thank some of them personally and explore for the first time ever, what must be a very friendly country.

Until then, to all you fine radio operators, I extend my sincere and heartfelt thanks.

Harold Rosenberg, VE2HRP

HELPLINES TRIUMPH!

I write to confirm that *Helplines* has triumphed again. You may recall I challenged your readers to help me. Well, inside a few hours of *RadCom* being delivered I had a phone call offering help and subsequent paperwork etc. Within a few days more paper *and parts* arrived to modify the equipment. A fantastic performance in the true amateur spirit.

I would publicly like to thank G0JJL, GI ERM and GB8HWS. Well done all.

James F Gray, GM3LRG

PARTICULARS WITHHELD

I have read with amusement the letters concerning the listing of names and addresses after callsigns in the Call Book and have yet to see a comment from those who withhold their particulars, so perhaps you will publish my reasons.

Since taking up amateur radio again after retiring, I have been suffering from a touch of the wanderlust and I am at present in France. To give an address in the Call Book would mean QSL cards sent direct arriving at old addresses, as human nature assumes Call Books never go out of date. At the moment, for my UK QTH, I use my daughter's address. If an enthusiast knocked at the door I am afraid she would have no idea what he or she would be talking about. It is for these reasons I prefer not to publish my address until I settle down again.

I must say I do like the Call Book, it is full of useful information and well worth the money. By all means publish members' titles and qualifications, I still like to be able to tell the difference between a man and a woman. If space is needed in the listing why not use initials for details withheld, ie, PWALR. The space saved could be used to give more details of lady members.

D A Williams, F/G3RNQ

SCHOOLS RADIO

Regarding the article on the Bardslown experiment (December 1989).

Until recently I was a pupil at King Edward's School (G8ZKE, G4SKE) in Birmingham which actually did have reasonable amateur radio facilities (a TS-520 and a 2m multimode). It also had about 5 licensees of which I was one. Unfortunately, this is where the interest stopped. It was hard work getting anyone interested outside of the five of us. The school offered a one-and-a-half-hour period on Friday afternoons in which aspects of amateur radio were discussed

Please note that the views expressed in 'Last Word' are not necessarily those of the RSGB.

We reserve the right to edit letters and regret that we can no longer acknowledge them individually but will pass them on to the relevant

of practical work was attempted. We had great problems in attracting interest, although towards the end of my time there were four much younger boys who shared a slight interest. I cannot understand why the American school in your article had such a high success rate.

The only explanation I have is possibly that if younger generation amateurs are to be found, as a rule they must be under about 13 (although I became interested at 14) to be struck by the enthralment of the hobby. Of course, in the UK to get a licence, you must be 14 which means that these intelligent 12 year olds who would be interested will have to wait for 2 years before becoming ORV.

Neil Derwent, G7CJI

[Hence the proposal for an lower age limit for the Novice Licence - Ed]

UNCLAIMED QSL CARDS

Since taking on the job of QSL Sub-Manager for the G0G series of callsigns just over 3 years ago, the pile of QSL cards which have not been claimed has steadily increased.

The purpose of pulling this note in RadCom is to inform all G0G stations that if they want to collect their cards they must send me some SAEs as soon as possible. I am currently holding just over 6500 unclaimed cards, and this figure increases by a few hundred after every box of cards received from the main bureau.

If stations do not want to collect their cards, perhaps they could inform me as soon as possible, otherwise I will soon be forced to destroy them to conserve space.

Nigel P Roberts, G4KZZ
(QSL Sub-Manager, G0G Series)

THE WORST OF BOTH WORLDS

I am neither a CW operator nor an SSB operator, but I would like to enter the 10MHz SSB debate from the point of view of someone who is increasingly getting caught in the cross-fire of SSB activity and deliberate CW jamming on this band.

In the early sixties when SSB was regarded with suspicion by the majority of AM operators, the SSB enthusiasts tended to keep "out of the way" by sticking to the top end of the bands. The present wave of "antisocial" 10MHz SSB seems to be following the same line.

The victim of all this is the RTTY/AMTOR operator, who is currently allocated the top 10kHz in the band-plan. Even though AMTOR is quite good at getting through the splatter from SSB signals, it nevertheless finds the going quite tough when the SSB activity attracts deliberate interference from CW stations who would otherwise not have ventured that far up the band.

It seems to me that the case against SSB on this band is not a strong one, and if it is based on the premise that we must avoid interference to other services, then the argument gets weaker as the other services move out. Widespread use of SSB on this band seems inevitable. My plea is for the IARU to recognise this before it happens rather than after, and sort out a new bandplan before the RTTY sub-band gets completely wiped out.

Peter Martinez, G3PLX

...word

RSGB MAIL-ORDER PRICE LIST

RSGB BOOKS

	NON-MEMBERS	MEMBERS
Amateur Radio Awards Book (3rd Ed)	£9.35	£7.95
Amateur Radio Operating Manual (3rd Ed)	£6.84	£5.81
Callbook - RSGB 1990	£9.95	£8.46
G-QRP Club Circuit Book	£6.54	£5.56
HF Antennas for All Locations	£7.24	£6.15
How to Pass the RAE	£6.47	£5.50
Microwave Handbook Vol.1	£23.29	£19.80
Morse Code for Radio Amateurs	£3.21	£2.73
Practical Wire Antennas	£8.09	£6.88
Radio Amateurs Examination Manual	£6.47	£5.50
Radio Communication Handbook Vols.1+2 (PB)	£13.82	£11.75
Teleprinter Handbook (2nd Ed)	£2.29	£1.95
VHF/UHF Manual (4th Ed)	£10.88	£9.25
World at their Fingertips	£8.62	£7.33

RSGB LOGBOOKS

Amateur Radio Logbook	£2.65	£2.25
Mobile Logbook	£1.36	£1.16
Receiving Station Logbook	£4.46	£3.79

RSGB MAPS CHARTS & LISTS

Great Circle DX Map (card for desk)	£0.59	£0.50
Great Circle DX Map (wall)	£3.21	£2.73
HF Awards List and Countries List	£0.54	£0.46
IARU Region 1 Beacon List	£0.44	£0.37
Locator Map of Europe (wall)	£2.17	£1.84
Locator Map of Europe (card for desk)	£0.79	£0.67
Locator Map of Western Europe (wall)	£1.18	£1.00
Meteor Scatter Data Sheets	£3.91	£3.32
Software Register	£1.18	£1.00
UK Beacon List	£0.44	£0.37
UK Repeater List	£0.56	£0.48
World Prefix Map in full colour (wall)	£3.38	£2.87

RSGB MEMBERS SUNDRIES (MEMBERS ONLY)

RSGB Lambswool sweater Code: A	£26.75
RSGB Acrylic sweater Code: B	£19.50
RSGB Acrylic Slip-over Code: C	£18.35
RSGB Shirts & Blouses Code: D	£18.99
RSGB Sweatshirts Code: E	£13.75
RSGB Sew-on Badges Code: F	£1.95
RSGB Banner Code: G	£7.95
RSGB Bear Code: H	£29.95
RSGB tie (coffee, maroon, green, blue - please state)	£4.50
RSGB 'Green Book' (details, structure, organisation and objectives of the Society)	£1.20
RSGB badge car sticker	£0.81
Standard callsign lapel badge (5 weeks delivery)	£2.96
De-luxe callsign lapel badge (5 weeks delivery)	£3.35
Standard lapel badge (RSGB emblem, pin fitting)	£1.36
Mini lapel badge (RSGB emblem, pin fitting)	£0.91
Members' headed notepaper (50 sheets) quarto	£2.81
Members' headed notepaper (50 sheets) octavo	£1.50
T & R Bulletin July 1926 souvenir copy	£0.45

MISCELLANEOUS

1990 RSGB Pocket Diary	£2.82	£2.40
1990 RSGB Desk Diary	£4.12	£3.50
Car sticker 'Amateur Radio' (2 colours)	£0.81	£0.69
Car sticker 'I Love Amateur Radio'	£1.14	£0.97
Car sticker 'I'm on the air with amateur radio' (4 colours)	£0.92	£0.78
Car sticker 'I'm monitoring 5, are you?' (2 colours)	£0.81	£0.69
Radio Communication back issues	£1.47	£1.25
Radio Communication bound volumes	£22.69	£19.29
Radio Communication bound volumes 1977-88		From £10.29
Radio Communication Easibinder (old and new sizes now in stock)	£5.82	£4.95
RSGB HF contest log sheets (100)	£3.87	£3.29
RSGB VHF contest log sheets (100)	£3.87	£3.29

OTHER PUBLICATIONS

All About Cubical Quad Antennas (RPI)	£7.00	£5.95
All About Vertical Antennas (RPI)	£7.65	£6.50
Amateur Radio Computer Networking Conference 5, 6, 7, 8		P.O.A
Papers (ARRL):Vols.1-4	£18.10	£15.39
Amateur Radio Satellites - The First 25 years (AMSAT-UK)	£4.65	£3.95
Antenna Compendium Volume 1 (ARRL)	£10.76	£9.15
Antenna Notebook, W1FB (ARRL)	£7.82	£6.65
ARRL Antenna Book	£13.71	£11.65
ARRL Operating Manual	£13.65	£11.60
AX25 Amateur packet radio link-layer protocol (ARRL)	£6.76	£5.75
Beam Antenna Handbook (RPI)	£8.53	£7.25
Better Short-wave Reception (RPI)	£5.87	£4.99
Callbook - International Listings 1990	£19.41	£16.50
Callbook - N American Listings 1990	£19.41	£16.50
Complete Dxer (Idiom)	£8.47	£7.20
Complete SW Listener's Handbook (Tab)	£15.24	£12.95
DX Edge (HF propagation aid)	£21.07	£17.91
FCC Rule Book, (ARRL)	£7.00	£5.95
First Steps in Radio (ARRL)	£4.41	£3.75
Fuji - FO12 Technical Handbook (AMSAT UK)	£5.65	£4.80
Guide to Oscar Operating (AMSAT UK)	£2.94	£2.50
Hints and Kinks for the Radio Amateur (ARRL)	£4.12	£3.50
History of QRP (Milliwatt Books)	£9.88	£8.40
Interference Handbook (RPI)	£8.35	£7.10
Introduction to Weather Satellite Reception	£2.94	£2.50
Joy of QRP (Milliwatt Books)	£11.35	£9.65
Linear Op-Amp Handbook (Carr)	£18.62	£15.83
Low Band DXing (ARRL)	£9.35	£7.95
Morse Code the Essential Language (ARRL)	£4.06	£3.45
Novice Antenna Notebook (ARRL)	£6.47	£5.50
Operating an Amateur Radio Station (ARRL)	£2.65	£2.25
QSCAR 13 Handbook (AMSAT-UK)	£6.06	£5.15
Passport to World Band Radio 1989 (RDI)	£11.71	£9.95
QRP Notebook (ARRL)	£4.12	£3.50
Radio Amateur Antenna Handbook (RPI)	£8.00	£8.80
Radio Amateur DX Guide (ARCI)	£4.12	£3.50
Radio Amateur Map of North America (ARCI)	£3.59	£3.05
Radio Frequency Interference (ARRL)	£4.12	£3.50
RTTY Awards (BARTG)	£3.47	£2.95
RTTY The Easy Way (BARTG)	£3.47	£2.95
Satellite Anthology (ARRL)	£4.41	£3.75
Satellite Experimenters' Handbook (ARRL)	£7.94	£6.75
Simple Low Cost Wire Antennas (RPI)	£8.53	£7.25
Slow Scan Companion (BATC)	£3.47	£2.95
Solid State Design for the Radio Amateur (ARRL)	£10.53	£8.95
Transmission Line Transformers (ARRL)	£8.18	£6.95
Tune in the World with Ham Radio (ARRL)	£4.12	£3.50
TV for Amateurs (BATC)	£2.02	£1.72
USA Licence Manuel - Advenced Class, ARRL	£3.86	£3.28
USA Licence Manual - Extra Class, ARRL	£3.86	£3.28
USA Licence Manuel - Technician Class, ARRL	£3.86	£3.28
World Atlas (ARCI)	£4.67	£3.97
Yagi Antenna Design (ARRL)	£11.71	£9.95
Your Gateway to Packet Radio (ARRL)	£7.70	£6.55
2MT Writtle - The Birth of British Broadcasting	£18.24	£13.80
25 Fun to Build Projects for Learning Electronics Theory	£7.82	£6.65
99 Test Equipment Projects (Tab)	£12.88	£10.95

INTERFERENCE SUPPRESSION FILTERS

Braid Breaker Filter	£8.76	£7.45
Ferrite Toroid (pack of 2)	£3.82	£3.25
High Pass Filter for FM Broadcast Band 2	£8.76	£7.45
High Pass Filter for UHF TV	£8.76	£7.45
Notch Filter Tuned to 14MHz	£9.93	£8.45
Notch Filter Tuned to 21MHz	£9.93	£8.45
Notch Filter Tuned to 28MHz	£9.93	£8.45
Notch Filter Tuned to 50MHz	£9.93	£8.45
Notch Filter Tuned to 70MHz	£9.93	£8.45
Notch Filter Tuned to 145MHz	£9.93	£8.45
Notch Filter Tuned to 435MHz	£9.93	£8.45
RSGB Filter Kit	£51.00	£43.35
Six Section Filter for UHF TV	£20.58	£17.50

Please note: These prices have been changed to reflect current production costs.

LANGUAGE AND MORSE INSTRUCTION AIDS

CW Into Foreign Languages (VE3EIM, VE3MGY)	£5.82	£4.95
Radio Amateurs Conversation Guide (OH1BR)	£5.65	£4.80
Dutch Supplement to Conversation Guide	£1.41	£1.20
French Cassette Supplement to Conversation Guide	£5.77	£4.90
German Cassette Supplement to Conversation Guide	£5.77	£4.90
Russian Cassette Supplement to Conversation Guide	£5.77	£4.90
Spanish Cassette Supplement to Conversation Guide	£5.77	£4.90
RSGB morse instruction tape (to 5wpm)	£5.04	£4.28

MAGAZINE SUBSCRIPTIONS

QST (including ARRL membership):		
One year - surface mail	£34.22	£29.25
Two years - surface mail	£70.34	£60.12
Three years - surface mail	£102.66	£87.75
One year - air (KLM) W.Europe only	£88.24	£75.00
Ham Radio Magazine, one year, by air	£25.74	£22.00

(Please wait 90 days before expecting delivery.)

NEWSLETTER SUBSCRIPTIONS

Connect International (monthly)	£9.35	£7.95
DX News Sheet (weekly)	£21.77	£18.50
Microwave Newsletter (10 issues per year)	£7.94	£6.75
Raynet News (6 issues per year)	£5.82	£4.95
6 Metre and Up DXer (monthly)	£9.35	£7.95

Newsletter subscription rates are those for subscribers in the UK and countries in the EEC. For rates to other destinations please contact the Circulation Department at RSGB, from where free sample copies of newsletters can also be obtained.

RAYNET SUPPLIES

Raynet Badge - Embroidered	£1.04	£0.88
Raynet Badge - Lapel	£0.89	£0.76

continued on next column

*** Members visiting HQ are advised to telephone first to confirm availability of goods (0707) 59015**

RSGB MAIL ORDER PRICE LIST

	NON-MEMBERS	MEMBERS
Raynet Badge Clip	£0.50	£0.43
Raynet Car Sticker - Circular	£0.65	£0.55
Raynet Identification Sticker	£0.51	£0.43
Raynet Manual, 1986 Edition	£3.41	£2.90
Reynet Poster	£0.98	£0.83
Raynet Tie	£5.83	£4.96

MICROWAVE COMPONENTS

Capacitors		
1000pF Collin Capacitor (pack of 10)	£1.08	£0.92
Trimmer for G4DDK 1152MHz boards	£0.99	£0.84
Exciters		
GDHM32 Doppler Module	£74.06	£62.95

	NON-MEMBERS	MEMBERS
Hardware, PCBs & Laminates		
G4DDK 1152MHz Amplifier Board	£4.11	£3.49
G4DDK 1152MHz Local Osc. Source PCB (RC 2-3/87)	£3.87	£3.29
CBT-40 Mounted Termination, 40W, 50ohm	£22.29	£18.95
CuClad 233 PCB, 0.005", 2 x 1inch block	£0.99	£0.84
CuClad 233 PCB, 0.031", 2 x 1inch block	£1.46	£1.24
Regulator PCB (RC 10/81)	£2.50	£2.13
UHF Source PCB (RC 10/81)	£7.06	£6.00
WG20 Copper Waveguide (per foot)	£7.14	£6.07
G4DKK PCB 004	£7.06	£6.00
Semiconductors		
DCI 501 E Mixer	£14.39	£12.23
MD4901 SRD	Out of stock	
MGF1302 GaAs FET	£8.18	£6.95
µPB581 C 2.6GHz Divide by 2 Prescaler	£8.02	£6.82
µPB582C 2.6GHz Divide by 4 Prescaler	£8.02	£6.82

HOW TO ORDER

NON-MEMBERS. Use left hand price columns. Note that members' sundries are only available to members of RSGB.

MEMBERS. Use right hand price columns. It is essential that you quote your callsign or RS number so that you can be recognised as a member.

PRICES. These include postage, packing, and VAT (where applicable) and are subject to change without notice.

AVAILABILITY. Goods are available less postage and packing from RSGB Headquarters between 9.15am and 5.15pm Monday to Friday. However you are advised to confirm availability of goods by telephone before visiting Headquarters. We attempt to keep ample stocks of all our sales items, however as this list has to be prepared several weeks in advance we cannot guarantee that any item on this price list is immediately available.

PAYMENT. Payment may be made by post enclosing a cheque or postal order. These should be crossed and made payable to 'Radio Society of Great Britain'. If sending cash please use registered post. You may use your credit card for payment by post or by telephone. We accept RSGB Credit Card, Visa, Access (Masterchargo), American Express, and Diners Club cards. Our telephone number for orders is (0707) 59015 (24hrs). Our Giro account number is 533 5256.

DELIVERY. Goods will be despatched to UK destinations by 2nd class letter post or parcel post, or surface mail to overseas destinations. Please contact RSGB Headquarters for 1st class letter post or airmail rates. We normally despatch goods within 60 hours after receipt of an order, but as delays can sometimes occur please allow 28 days before enquiring about non-delivery of goods.

ORDER FROM:
RSGB SALES (CWO)
Lambda House, Cranborne Road,
Potters Bar, Herts, EN6 3JE

RADCOM PCB SERVICE

G4PMK SIMPLE SPECTRUM ANALYSER

November 1989

BOARD DESCRIPTON	CODE	PRICE
RF Board	118946	£6.11
Video/sweep board	118947a	£4.88
Marker generator/PSU	118947b	£4.49
Complete set of 3 boards	1189SSA	£14.38

G3TXQ TRANSCEIVER

Febuary/March 1989

BOARD DESCRIPTION	CODE	PRICE
Main IF/Audio	028945	£11.50
VFO	028946	£5.46
Driver/Preamp	028947	£6.33
Low pass filter	028948a	£7.48
Band-pass filter	028948b	£4.60
Control board	038942a	£5.18
Regulator board	038942b	£2.30
Complete set of 7 boards	0289TXO	£27.03

G3TSO MODULAR TRANSCEIVER

October/November 1988

Complete set of 7 boards	101188TSO	£34.00

All prices include postage and packing.
Please note these PCBs are not available from RSGB HQ, but direct from Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coalfield B74 4JF. Tel: 021-353 9326

CLASSIFIED ADVERTISEMENTS

Classified advertisements 50p per word (VAT included) minimum £7.00.
Please write clearly. No responsibility accepted for errors. Latest date for acceptance — 5 weeks before 1st of issue month. Cheques should be made payable to RSGB.
All classified advertisements MUST be prepaid.
Copy and remittance to:— **Victor Brand Associates Ltd, 'West Barn', Low Common, Bunwell, Norwich, Norfolk, NR16 1SY.**
NB. Members' Ads must be sent to "Members' Ads," RSGB Hq.

FOR SALE

AMIDON/MICROMETALS TOROIDAL CORES, Ferrite, Beads, Rods etc. Send 50p for catalogue. Ferromagnetics, P.O. Box 577, Mold, Clwyd, N.Wales CH7 1AH.

QSLS 1000 £21 (SWLS, Logs, Colour cards, Stamps, Patches. — S.A.S.E. for samples). Currie, 87 Derwent St, Consett, DH8 8LT.

QSL CARDS. Try me for quality and price. SAE for samples. A. W. Bailey (G3YNI), Brean Down Press, 78 Alfred Street, Weston-Super-Mare, Avon BS23 1PP.

"RAYNET" YELLOW REFLECTIVE TABARDS with "Raynet" like Police, Ambulance. Medium £9.50, Large £10.00, XLarge £10.50. "Raynet Controller" 50p extra. "Raynet Control" road sign 900mm x 600mm tripod mounted £49.50. Nonreversible battery connectors (10 pairs/pack) £4.50. Mike Watson G8CPH, Ipswich (0473) 831448

MOSLEY ANTENNAE — All the famous British Manufactured Antennae, direct from us including spares/replacements. Mustang, Elan, TA-33Jnr etc. Full Details shown in our Handbook, price £1.25 refunded upon purchase of Antennae. Mosley Electronics, 196 Norwich Road, New Costessey, Norwich NR5 0EX (Administrative address only).

ANTI-TVI MULTIBAND AERIALS, TRAP DI-POLES, F7FE. Aerials, Traps, Baluns, etc. Data 30p SAE. Aerial Guide £1. G2DYM, Uptowman, Devon EX16 7PH. (03986) 215.

SAVE MONEY — MAKE IT YOURSELF! DIY projects — Loops, ATU's, Field Strength Meter, SAE G2VF QTHR.

QSL CARDS to your design on coloured cards. SAE Caswell Press, 11 Barons Way, Woodhatch, Reigate, RH2 8EU. (0737) 244916.

WE CAN SUPPLY ICOM, Yaesu, Uniden, Weiz, Navico, S.W.L. ATU from £39 + £2.50 p&p. Also full range of Ant, Cables, etc. Please send for list. Seaward Electronics, Unit 10, Lynstone Trading Est, Bude, Cornwall. Phone 0288 355998, after 6pm 0288 354892. Access, Visa, R.S.G.B. Master Card.

CALLSIGN BASEBALL CAPS — Blue, Red or Black, send £3.90 including p&p. Send for details of callsign shirts. M. J. Hilton, 3 Highfields, Heswall, Wirral, L60 7TF.

G4MH MINI BEAM for HF, still at £98 Inc VAT. SAE details. Supplies of Kenwood, Yaesu etc. Selection of used equipment. The Amateur Radio Shop, 4 Cross Church St, Huddersfield, West Yorkshire. 0484 420774.

QSL CARDS designed personally for you, or one of our wide range of special pictorial designs in single or multi colours, raised print or normal print, super-gloss or matt board. For quality and value send L.S.A.E. for samples to: Contact Cards, 289 Church Street, Blackpool, FY1 3PE, Lancs

70Mhz FULL SPEC CRYSTALS PYE WTS 70.260 AM/FM. 70.450, 70.475, 70.425 FM Ex Stock at £10.50 per pair. Made to order service available. C.A.R.E. (North West) Ltd, 12 Leeside Close, Liverpool, L32 9QT. Tel. 051 426 2546 (evenings/weekends).

G4TJB QSL CARDS. QSL CARDS printed to your specification including photocards and cartoons. ANTENNAS (whips to beams), SCANNERS, TRANSCEIVERS, POWER SUPPLIES, LINEARS, PREAMPS, CABLE, CONNECTORS. We can supply almost anything (phone and ask) Part exchange welcome. For samples and product list S.A.E. to 24 Portishead Road, Worle, Weston-Super-Mare. BS22 0UX. 0934 512757.

QSL CARDS. Gloss or tinted cards. SAE for samples to Twrog Press, Penybont, Gellilydan, Blaenau, Ffestiniog, Gwynedd LL41 4P.

PRINTED CIRCUIT BOARDS supplied for one-offs, prototypes and as quantity runs. High quality PCBs made to order for all RAD COMM projects. We can supply 'home brew' PCB kits, materials, tinning solution and the right tools. Artwork supplied 2 to 1 and from your schematic drawings. Also film positives and a plotting service. Please send SAE for information or write for quotation to Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4J or call 021-353 9326.

MAKE YOUR QSL a collector's item with GW3COI's personalised sketch £10. Penrhynbach, Abersoch 2675.

QSL CARDS. Clear plastic hanging display wallets hold 20 cards. Pack of three £3.20. Viola Plastics 36 Crott Road, Hastings, Sussex.

J.A.B.. The new name in MAIL ORDER. Electronic and R.F. Components, with an evening telephone service. Catalogue 50p (Refunded on first order) from:- JAB, 76 Wensleydale Road, Greatbarr, Birmingham B43 1PL.

DRAKE "C" LINE £590 with P.S.U., extra bands, C.W. filter, 200W, mint, GD4HIT, 0624 880433 evenings.

CALLSIGN JUMPERS AND PULLOVERS, all machine knitted, prices from £17 + pp. Send S.A.E. for colours and designs to Mrs Jan Payne, 5 Wellington Crescent, Blenheim Park, Sculthorpe, Norfolk NR21 7PU

SYON TRADING: Special offers. Coax Relays, BNC, 100w CW, 2 way 24v £18, 4 way 12v £22, 6 way 12v £25. 100 mixed LEDs £5. Used Greenpar PL259 6 for £3.25. See our advertisement in March or April Radcomm. We will be at many rallies during 1990.

G3LLL FOR ICOM AND YAESU Best allowance for your old rig — also Ten. Tech, Alinco, J Beam, DRAE, MFJ etc. — Valves see March ad. — Black Star 600MHz counters £149 p.p. — W.A.R.C. kit FT101MK1-E 3 new bands for £19.50!! — D.B.M. much improves RX on FT101MK1-E £19 — FT707 outputs Tosh. 'Black Spot' 2SC2290 £48 p.p. — CW filters FT101ZD, 902, 707, 102 £40 p.p. — Scanners, commission sales 15 mins M6 Junc 31 — see below.

G3LLL's HOLIDAYS — closed late May early June — phone Holdings Amateur Electronics, 45 Johnston St., Blackburn BB2 1EF. (0254) 59595 — closed Thurs.

R.F. TRANSISTORS, capacitors, coils, ics, etc. S.A.E. for details. Heller Electronics, 49 Blossom Way, Hounslow TW5 9HB.

SELLING A RIG? Looking for a rig? National Listings. Phone 0297-60556. (G0HET QTHR).

RSGB AMATEUR RADIO INSURANCE SCHEME

"ALL RISKS" INSURANCE for portable/mobile/base station amateur radio and ancillary equipment. A service for RSGB members only. Also public liability and equipment insurance for affiliated clubs and societies. Details and leaflets from Sarah Baylis or Jenny Lovell, Amateur Radio Insurance Services Ltd, 4a Russell Hill Road, Purley, Surrey CR2 2LA. Tel: 01-660 0820 or Fax: 01-660 9222.

COMPUTER SOFTWARE HARDWARE

AMSTRAD/IBM PC COMPATIBLE SOFTWARE. Large SAE to Charles Crane G4YFN, 2 Pimento Drive, Earley RG6 2GZ.

THE G4TYF LOG, date, band, power, mode, time, callsign, name, QTH, RX/TX/RPRT. Search QSL/Log, print out labels, nice screen, four inputs. Disk 2000 entries, free resistor decoder. BBC, Commodore 64, £20. Enclose callsign. E. Aston, 64 Gurney Valley, Bishop Auckland, DL14 8RW. 0388-607500.

G4UXD'S CELEBRATED MORSE TUTOR: BBC's, IBM-PC, compatibles. Adjustable speed, delay, letter frequency, 100 tests, attach your key, +++++! 7.95 disc. SAE details/free trial! D. Brandon, 1 Woodlands Road, Chester CH4 8LB.

G3WHO AMTOR/RTTY/CW MK II BBC B/Master. Full feature, split screen, memories, mailbox, selcall, etc. Eprom £27. P. J. Harris, 10 Appleby Close, Great Alne, Alcester, Warwickshire B49 6HJ. Tel. 0789 488377.

IBM PC CLONES. AMTOR software £30 works with any good RTTY T.U. RTTY software £15. AMTOR + RTTY £40. Split screen, disk logging, printing, callsign capture and many more superb features. Grosvenor Software (G4BMK), 2 Beacon Close, SEAFORD, Sussex BN25 2JZ. (0323) 893378.

3½ INCH DISCS, 1 Mb DSDD branded quality. Boxes of 10 with labels. Suitable ST, Amiga etc. £8.50, 5 for £8 each. G0KHX 01-575 3945.

HOLIDAY ACCOMMODATION

FLYING FROM GATWICK? Stay at Mill Lodge Guest House, 4 minutes from airport. Transport available. Telephone (0293) 771170.

GULF COAST, TAMPA, FLORIDA. Luxury bungalow, sleeps 6-8, close to all Florida's attractions, £250 per week. Phone Bob G0GHT on 040-928-475 for further details.

ELEVATED SITE, use of shack, B&B. Caravan, Bunk House, Camping. Open all year. "Tynrhos", Mynytho, Pwllheli LL53 7PS. (0758) 740712.

CORNWALL. FARMHOUSE ACCOMMODATION. B&B, E.M. six berth caravan. Set in a secluded location near Truro. Tel John (G4LJY) 0872 863849.

MISCELLANEOUS

HEATHKIT UK spares and service centre. Cedar Electronics, Unit 12, Station Drive, Bredon, Tewkesbury, Gloucestershire. Telephone (0684) 73127.

COURSE FOR CITY & GUILDS, radio amateurs examination. Pass this important examination and obtain your licence, with an RRC home study course. For details of this and other courses (GCSE, career and professional examinations, etc) write or phone — THE RAPID RESULTS COLLEGE, Dept JT100, Tuition House, London SW19 4DS. Tel: 081-947 7272 (9am-5pm) or use our 24hr Recordacall service 081-946 1102 quoting JT100.

HOME VIDEO CAMERAMEN — Send your friends overseas a videotape. We convert your videotapes between NTSC/PAL/SECAM. Details from GM8NVG, STABLE RECORDINGS, Lochend, BEITH, Ayrshire, KA15 2LN. 0505 85488.

ELECTRONICS WORKSHOP Repairs, rebuilds, modifications, advice. Specialists in valve equipment. Also PAYL School, Green G1NAK Chylean, Tintagel, Cornwall. 0840 212262.

QSL WRITING SERVICE for contesters, DXers, busy people, £3 per 100. Details (0521) 77842.

PATENTS, TRADE MARKS AND DESIGNS. Literature on request. Kings Patent Agency Ltd, established 1886. 74 Farringdon Road, London EC1M 3JB. Telephone 01-248 6161. Telex 883805 and Fax 01-831 9306. (G5TA, G3ZZE).

ADVERTISING

DISCOUNT ON ADVERTISING. Classified advertisers are reminded of the 10% discount available on all classified contracts for twelve consecutive insertions booked and paid in advance.

J. BIRKETT

25 The Strait
LINCOLN LN2 1JF
Tel: (0522) 520767

R.F. POWER TRANSISTORS. TPV 596 @ £3.95, BLX13 @ £4.95, TP 3094 @ £3.95, BLY 97 @ £3, BFR 64 @ £4, 2N 3733 @ £3.95. **MULLARD R.F. POWER MODULE.** BGY 32 68 To 88 MHz 100mW To 18 Watt 12 Volt @ £18.95. **PHILIPS RESISTORS MR 25** 11 OK 2%. £1 Per 1000. **TRANSISTORS.** BC 557 Preformed Leads 20 For 80p, BST 72A @ 20p, each, BS 107 @ 20p each, BCY 71 @ 10 For 75p, BUX 82 @ 55p each, LM 250K @ 85p, 2N 3716 @ 60p, BSV 64 @ 8 for 75p. **GaAS FETs** 18 GHz Stripline Package Out of Spec. Devices @ 3 For £1.99. **SURFACE MOUNTING CAPACITORS** 0.1uf 63v.w. @ 30 For £1. **X BAND GUNN DIODES** @ £1.65. X BAND DIODES LIKE 1N23 @ 45p. SIM 2 @ 45p, 1501E @ £1.65. **81 OHNO BOOT MOUNTING 10 CHANNEL TRANSCEIVER** 79 To 110 MHz. No Accessories. @ £8. (P.& P. £3.) **CRYSTAL FILTERS. SEI** OCI 245 10.7 MHz BW 7.5 KHz @ £3.95 **MURATA CERAMIC FILTER** 455 KHz @ 6 For £1. **AIRSPACED VARIABLE CAPACITORS.** 200+350pf @ £2.50, 500+500pf @ £2.95, 500+500pf Medium size @ £3.30, 500+500pf Large Broadcast Type @ £3.50, Transmitting Type 150pf @ £3.50. **EX-MILITARY COMMUNICATION RECEIVER** Type R210. 2 To 10 MHz Converted To 250 Volt Mains @ £79.80. Carr £8.00. **TRANSISTORS.** 2N 3421 Similar To BFY 51 @ 12 For £1. **FETs.** 2N 3819 @ 25p, 2N 3824 @ 25p, Dual Gate 3N201 @ 80p. VN1 0KM @ 50p, VN1 0LM @ 40p, WM211 @ 40p. **MINIATURE WIRE ENDED ELECTROLYTICS** 4.7ul 50v w., 10ul 63v.w., 1000uf 10v.w. All @ 12 For £1

ACCESS AND BARCLAY CARDS ACCEPTED. P&P. 60p UNDER £5. OVER FREE, UNLESS OTHERWISE STATED. C.M. HOWES AND WOOD & DOUGLAS KITS AVAILABLE BY POST AND FOR CALLERS.

muTek limited

"I've got a muTek in my rig"

Have you? Which one is it? muTek manufacture a range of products that can be fitted inside a variety of rigs. The smallest of these is the SLNA 144sb which is a small low noise preamplifier (including Tx change over relay) that fits inside the FT290R. The newest 'muTek' is the RPCB 202ub which is a complete receiver front end replacement for the IC202 series transceivers. The front end replacement has more benefits than a preamplifier, not only does it increase the sensitivity of the receiver it also increases the dynamic range. This means that you are less susceptable to the effects of strong signals.
The RPCB 144ub for the Yaesu FT221/251 and the RPCB 251ub and RPCB 271ub for the ICOM IC251/211 & IC271 tranceivers are still popular and make a big difference to the performance of these rigs.

So which 'muTek' is yours?

P.S. a series of telephone calls which started "I've got a muTek in my rig..." were responsible for this advert; 95% of the time the particular 'muTek' is the SLNA 145sb.

For full details on our replacement front ends and other products please write to:

VISA RSGB

muTek limited – the rf technology company
Dept. RC. P.O. Box 24. Long Eaton. Nottingham NG10 4NQ 0602 729467

HOLIDAY ON RARE DX ISLAND

"If it is good enough for the Square bashers, it must be good enough for you!"
(See March RadCom)

Work the pile-ups from the comfort of our Holiday Guest House situated on GOZO (JM76AB). Included in the price is use of *Fully Equipped Shack*. All travel and accommodation arranged. All paperwork included for your 9H Call Sign. For further details please phone or write to:

T. Menzies, OM/9H3LY
31 Pentland Terrace, Edinburgh, Scotland, EH10 6HD. Tel: 031-447 3219

EARLY WIRELESS WANTED

TOP CASH

FOR OLD RADIO EQUIPMENT, CRYSTAL SETS, HORN SPEAKERS, EARLY VALVES, CLANDESTINE RADIOS, EARLY DOMESTIC RECEIVERS, ANY CONDITION.

JIM TAYLOR G4ERU
5 Luther Road, Winton, Bournemouth. Tel: 0202-510400.

HATELY ANTENNA TECHNOLOGY GM3HAT

1 Kenfield Place, ABERDEEN, AB1 7UW, Scotland, UK

ADVANCED ANTENNA TECHNOLOGY

In 1981 the CAPACITOR DIPOLE Patent was applied for, and after the necessary searches, was granted both in the UK (Numbers 2,112,579 and 2,142,190) and in the USA (4,518,960). Many in the professional and amateur communications fraternity were surprised that a new technique for feeding half-wave dipole antennas could be invented after nearly 100 years of development in a highly researched subject.
The incorporation of pairs of capacitors at the centre, not only gives better matching to the 50 ohm feed, but also: (i) Near perfect balance even when feeding to coax cable, and thus (ii) Better rejection of local electrical machine interference, TV time base harmonics, computer hash etc, when the antenna is receiving in the usual urban environment obligatory for most amateurs (iii) Multi-resonant (or solo) resonant behaviour with LOW VSWR without an ATU
We have sold several thousand of these since 1983 and they are well confirmed as the 'DIPOLE OF DELIGHT' by the very small return rate by customers making use of our "No Quibble" money back within one month guarantee. Actually less than 3% in all the six years of trading.
In 1988 the CROSSED FIELD ANTENNA patent was applied for, and the searches are going forward in the UK, Europe, and the major industrial countries. As readers of the Electronics World and Wireless World will know, the CFA has been confirmed by independent investigators. In fact a national broadcasting organisation has had success under our licence with small ground plane versions at Medium Wave, radiating successfully 1kW and 11kW and soon even higher powers.
Full DATA on the CAPACITOR DIPOLES, and the CROSSED FIELD ANTENNA kits, send Four First Class Stamps (or 3 IRC's).

Proprietor: Maurice C Hately, MSc, FIEE Chartered Electrical Engineer. Licenced 1950; then G3HAT now GM3HAT

LOUDENBOOMER

400w o/p, Mains Powered, 9 Band H.F. Linear.

Introductory Offer only £499, direct from the designers and manufacturers: S.R.W. Communications Ltd, ASTRID House, The Green, Swinton, MALTON, North Yorkshire YO17 0SY. Tel: Malton (0653) 697513

Please write or 'phone
Steve Webb G3 TPW
for more details and leaflets.

SERVICE MANUALS

Available for most Video Recorders, Colour and Mono Televisions, Cameras, Test Equipment, Amateur Radio, Vintage Valve Wireless, Any Audio, Music Systems, Computers, Kitchen Appliances etc.

Equipment from the 1930's to the present and beyond.
Over 100,000 stocked, originals and photostats.
FREE catalogue Repair and Data Guides with all orders.

MAURITRON TECHNICAL SERVICES (RC)
8 Cherry Tree Road, Chinnor, Oxfordshire, OX9 4QY
Telephone: (0844) 51694 office hours. Fax: (0844) 52554

KANGA'S QRP KITS

KITS FOR THE AMATEUR, BUDDING AMATEUR & THE LISTENER

KANGA PRODUCTS is a small **BRITISH** company providing kits for amateurs throughout the world. We provide *clear, precise instructions* coupled with *superb quality PCB's* and only the *very best components*, without making the finished project appear like 'painting by numbers'. If you don't like what you buy, we also give a full, money back guarantee with each and every kit that we sell.

DIRECTIONAL POWER METER

George Dobbs — "Our initial test of this design suggests it is better than the BIRD wattmeter. This circuit will become an amateur radio standard" much better than SWR bridge — actual fwd and rev powers are displayed. Supplied less the two required meters at £17.95

DUMMY LOAD KIT

Have you got one? Everyone should have a dummy load in the shack and ours is ideal, with facilities for power readings, and up to 100 watts for 1 minute too. Only £18.95

Prototype 'Sudden' RXS

IAMBIC KEYER

An Iambic keyer on a small PCB, full dot-dash memories too. Excellent value at.....£16.95
Also available the KANGA speed control. 6 presets on a small PCB to ensure your speed is accurate at all times.....£2.95

MORSE OSCILLATOR

A morse code practice oscillator that is an ideal aid for those who wish to learn CW. It also acts as a sidetone for your homebrew rig and also as a bench AF amplifier.....Just £12.95

THE 'SUDDEN' QC RECEIVER

A very neat Direct Conversion receiver designed by the Rev George Dobbs. Ideal for all bands up to 40m but will still work at 20m. Very simple to build too, ideal as a first project for a youngster. And only.....£17.95

Please add £1 for p&p
Some kits are supplied semi-complete. Send a large SAE for full details.

KANGA PRODUCTS, 3 Limes Road, Folkestone, Kent CT19 4AU. Tel: 0303 276171
TRADE ENQUIRIES WELCOMED

VALVES VALVES VALVES

The following valves in matched pairs 6JS6/C, 6KD6, 6JB6/A, 6LQ6, 6HFS, 6146A, 6146B. YES the 6JS6/C is Japanese and works in the FT101. Most amateur radio valves including difficult to obtain types **EX STOCK.** Quotations without obligation. If we don't stock your type we may be able to import for you, PLEASE ENQUIRE, REMEMBER over 200 types **EX STOCK.** Sae for list. 'Phone for assistance to types suitable for your equipment. USA and Jap manufacture of popular types available.

DON'T DELAY 'PHONE TODAY 045 75 6114, G4AZM
Wilson, Peel Cottage, Lees Road, Mossley, Lancs OL5 0PG

PROCOMM (UK)

Cash paid for used Amateur Equipment. Part exchange welcome.
SAE for stock list

9am-9pm, Mon-Sat. 0235 532653. 0860 593052.

Callers by appointment please: 102 Larkhill Rd, Abingdon, Oxon.

CASH — CASH — CASH — CASH

NOTICE TO OUR READERS

Although the staff of Radio Communication take reasonable precautions to protect the interests of readers by ensuring as far as practicable that advertisements in our pages are bona fide, the magazine and its publisher, The Radio Society of Great Britain, cannot give any undertakings in respect of claims made by advertisers, whether these advertisements are printed as part of the magazine, or are in the form of inserts.

While the publishers will give whatever assistance they can to readers having complaints, under no circumstances will the magazine accept liability for non-receipt of goods ordered, or for late delivery, or for faults in manufacture. Legal remedies are available in respect of some of these circumstances, and readers who have complaints should address them to the advertiser or should consult a local Tradings Standards Office, or a Citizen's Advice Bureau, or their own solicitor. Readers are also reminded that the use of radio transmission equipment is subject to licencing and the erection of external aerials may be subject to local authority planning regulations.

INDEX TO ADVERTISERS — MAY

ICOM

Count on us!

IC-765 HF ALL BAND TRANSCEIVER

We enjoy listening. It's part of what we do well. So when ICOM heard you talking, our engineers designed a transceiver specially for you – the serious DX enthusiast with worldwide contacts in mind. The result is the new super advanced IC-765, an HF all band transceiver built to expand your HF world.

The IC-765 is equipped with ICOM's exclusive DDS (Direct Digital Synthesizer) System, a fully automatic antenna tuner, an electronic keyer with iambic operation and a full break in function.

Fully Automatic High Speed Antenna Tuner
A built in CPU automatically memorises the pre-set position of each band without pre-set controls. Tuner speed is ultra fast since tuning starts from a preset position. If the tuner cannot tune from the previous preset position, the re-try function changes the preset position and memorises the best position.

10Hz Digit Display
The large fluorescent display shows 7 digits for the operating frequency, the 10Hz digit is displayed.

Band Stacking Register
Each band memorises the last used frequency, mode and IF filter condition (narrow or wide).

Complete System for CW Operators
The IC-765 has many advanced functions for CW operators such as CW pitch control, a built-in electric keyer, a keying speed control and high speed full break-in capability.

New PLL Circuit
The advanced ICOM DDS System ensured high speed PLL lock-up times, clear signal emissions, and high C/N characteristics. A high speed PLL provides very fast CW full break-in performances.

Convenient Miscellaneous Functions

- 105dB dynamic range
- 10dB preamp and 10, 20 30 dB attenuator
- 99 memory channels
- Split memory on channels 90-99
- Built-in FL32A and FL52A CW narrow filters
- Programmed scan and memory scan
- IF shift and Notch filter
- Fast/Slow/OFF Selectable AGC
- RF type speech compressor
- Noise blanker
- DATA switch for advanced data communications

Icom (UK) Ltd.
Dept RC, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour.

Helpline: Telephone us free-of-charge on 0800 521145. Mon-Fri 09 00-13.00 and 14.00-17.30 This service is strictly for obtaining information about or ordering Icom equipment. We regret this cannot be used by dealers or for repair enquiries and parts orders, thank you.
Datapost: Despatch on same day whenever possible
Visa & Mastercards: Telephone orders taken by our mail order dept, instant credit & interest-free H P

Yaesu's FT-736R. Because you never know who's listening.

Why just dream of talking beyond earth?

With Yaesu's new FT-736R VHF/UHF base station, you can discover some of the best DX happening in ham radio. Via moonbounce. Tropo. Aurora. Meteor scatter. Or satellites.

You see, the FT-736R is the most complete, feature-packed rig ever designed for the serious VHF/UHF operator. But you'd expect this of the successor to our legendary FT-726R.

For starters, the FT-736R comes factory-equipped for SSB, CW and FM operation on 2 meters and 70 cm, with two additional slots for optional 50-MHZ or 1.2-GHz modules (220-MHz North America only).

Crossband full duplex capability is built into every FT-736R for satellite work. And the satellite tracking function (normal *and* reverse modes) keeps you on target through a transponder.

The FT-736R delivers 25 watts RF output on 2 meters, 220-MHz, and 70 cm. And 10 watts on 6 meters and 1.2-GHz. Store frequency, mode and repeater shift in each of the 100 memories.

For serious VHF/UHF work, use the RF speech processor. IF shift. IF notch filter. *CW Narrow Optional and FM wide/ narrow IF filters. VOX. Noise blanker. Three-position AGC selection. Preamp switch for activating your tower-mount preamplifier. Even an offset display for measuring observed Doppler shift on DX links.

And to custom design your FT-736R station, choose from these popular optional accessories: Iambic keyer module. FTS-8 CTCSS encode/decode unit. FVS-1 voice synthesizer. FMP-1 AQS digital message display unit. 1.2-GHz ATV module. MD-1B8 desk microphone. E-736 DC cable. And CAT (Computer Aided Transceiver) system software.

Discover the FT-736R at your Yaesu dealer today. But first make plenty of room for exotic QSL cards. Because you *never* know who's listening.

YAESU

*CW narrow optional

UK Sole Distributor ***South Midlands Communications*** *S.M. House, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hants SO5 3BY. Tel: (0703) 255111*

Prices and specifications subject to change without notice. FT-736R shown with 220-MHz option installed.